THE ADDED VALUE OF A COOPERATIVE EDUCATION PROGRAM

VOLUME 1

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CANDIDATE'S STATEMENT:

This is to certify, that except where due acknowledgement has been made, this work is mine alone. The work has not been submitted previously, in whole or part, to qualify for any other academic award. Furthermore, the content of the thesis is the result of work that has been carried out since enrolment into the program, Doctor of Business Administration.

Miriam Weisz

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ABSTRACT

Co-operative education (co-op) is a form of work-integrated-learning that involves university undergraduate students undertaking full-time paid and discipline-related employment as a structured part of their program of study. Co-op programs provide learning opportunities for students that enable them to integrate their work and their academic experiences. Such opportunities, provided that a number of conditions are met, can lead to deep level learning. Deep level learning results when students engage in and interact with the material that they are learning so that the material is integrated into their knowledge and personal understanding. Whether or not deep level learning occurs through co-op, depends on various factors including the learning opportunities provided by co-op employers, the students' own commitment and ability to learn, and the commitment of university staff to support this learning. Insufficient resourcing of co-op programs by universities and ultimately the government places a major constraint on the programs' potential effectiveness in bringing about the desired learning outcomes for students. This is particularly the case in Australia where universities are under enormous pressure of reduced government funding and the long-term sustainability of co-op programs is under threat.

In order to justify more funding for co-op programs, it is important to identify and measure the outcomes associated with undertaking co-op. There has been a great deal written about the outcomes of co-op programs and the associated benefits that accrue to the major co-op stakeholders; students, graduates, universities and employers. Most of the measurement of these outcomes has, however, taken place in North

America. Furthermore, studies have generally focused on the outcomes for one, or sometimes two, stakeholder groups. The results of many of these studies have been limited by confounding variables and have been very mixed; with some providing evidence that supports co-op and others providing evidence that does not. Little work has been done to estimate the costs associated with running co-op programs.

This thesis considered the research question of what is the added value of a cooperative education program. A positivistic paradigm was adopted and empirical measures of learning and employment outcomes were analyzed for co-op compared to non co-op students and graduates. The graduates taking part in the study were matched in an effort to overcome some of the methodological limitations of other studies. The majority of the graduates had completed an Economics, Finance or Commerce degree at one of two major universities located in Melbourne, Australia: one university provides a compulsory co-op program, the other does not.

Through the analysis of the learning outcomes of co-op, this study found that co-op led to a reduction in the proportion of students adopting a surface approach to learning. The shift from students adopting a surface approach to students adopting a deep approach to learning as a result of co-op, was not evidenced as strongly as expected. This may have resulted in part, from the lack of funding necessary to provide the level of learning support required to bring about these learning outcomes. There is, however, evidence to suggest that co-op has a significant impact on the academic performance of students and particularly for those whose academic performance pre co-op was low.

When employment outcomes for co-op graduates and non co-op graduates were analyzed, it was evident that 90% of co-op graduates, compared to only 19% of non co-op graduates, found discipline-related employment within one month of actively seeking a job. Furthermore, co-op graduates took an average of two weeks to find employment whereas non co-op graduates, with no undergraduate discipline-related work experience, took an average of three-and-a-half months.

There is evidence that employers recognized, through increased salaries, the benefit of the co-op year over and above the experience that can be gained from summer placements, traineeships and post co-op discipline-related work. While the starting salary for co-op graduates, was significantly higher than for non co-op graduates, this difference disappeared when both cohorts had the same number of years of industry experience. Even though this result, which is consistent with other studies, appeared not to demonstrate the increased salary advantages associated with co-op, there is another factor that needed to be taken into consideration. The co-op graduates in this study had a range of academic achievements yet their graduate employment outcomes were at least the same as those for the non co-op graduates who were all high academic achievers.

The impact that co-op has on the achievement of relevant strategic goals and key performance indicators specified by the co-op university was considered and an estimation was also undertaken of the cost of providing this co-op program over and above the government funding received for its support.

It was found that while the co-op program attracted students with the same university entry score as the non co-op program, the non co-op graduates would, with hindsight, have chosen a co-op degree. This suggests that the pool of quality students applying for entry into the university offering co-op programs could be increased with more effective marketing of co-op to secondary school-leavers. Academic progression rates and retention rates, two university key performance indicators, were high for co-op students and co-op was a significant factor in achieving the university objective of graduate employability.

While co-op has had a significant impact on the achievement of relevant university goals, it was also found that the university that offers co-op incurs a funding shortfall of approximately $1,300 for every Economics and Finance co-op student. This amounted to a total funding shortfall of $41,600 for the 32 co-op students included in this study. One option that is available to the university to find support for the long-term financial sustainability of co-op programs is to seek a share of the significant cost savings experienced by the two other major stakeholders in a co-op program – the government and the employers of co-op graduates.

The estimated savings in graduate recruitment costs as a result of co-op students returning to companies as graduate recruits varied from $1,100 to $3,000 per graduate. This resulted in a total saving of between $19,000 and $51,000 for the 17 Economics and Finance students in this study who returned to their co-op companies as graduate recruits. The impact of co-op on social welfare payments made by the government was also quite significant. It was estimated that co-op led to savings of approximately $15,000 in social welfare payments for every co-op graduate - the total

social welfare payments made to all the non co-op graduates being $147,000 higher than the total social welfare payments paid to the co-op graduates included in this study. To achieve these benefits of co-op, the government funds co-op programs at a rate of $1,800 per student.

For the 800 RMIT Business students who currently undertake co-op each year, the funding shortfall experienced by RMIT was extrapolated to be $1.04m. The associated saving to graduate employers was estimated to be between $500,000 and $1.37m and the expected saving to the government in social welfare payments was estimated to be over $4m while the total funding of co-op programs for the 800 students by the government was $1.44m. These figures provide a strong case for an increase in the financial support of co-op programs.

In conclusion, while there is a need to extend the research into the added benefits of a cooperative education program to a longitudinal study also covering other discipline areas, there is evidence to show that improved academic and employment outcomes occur for co-op graduates compared to non co-op graduates. There is also evidence of significant cost savings that accrue to the Australian Federal Government and to graduate employers as a result of co-op. If these data can be used to transfer resources to the universities that provide these programs then greater efforts can be made to direct the resources in a way that will further enhance the learning and the employment outcomes for co-op graduates.

Chapter 1

THE STUDY FRAMEWORK

1.0 Chapter 1 Summary.

This chapter provides the framework for the study of the measurable value that co-op adds to a degree program. Co-op is defined and its potential role in students' learning is discussed. The conditions necessary for this learning to take place are identified and it is argued that a lack of funding for co-op could result in these conditions not being met. If an argument for increased funding for co-op is to be mounted, then empirical evidence of co-op outcomes and costs for all its major stakeholders is required. The major co-op stakeholders are identified as students, graduates, universities, employers and the government. A review of the literature pertaining to the co-op outcomes for these stakeholder groups is undertaken. The limitations of the reviewed studies are also discussed and the steps that could be taken to overcome these limitations are documented. The research question is then identified as "What is the added value of a cooperative education program?" and this question is divided into three categories – The learning outcomes for co-op students, the employment outcomes for co-op graduates, and the co-op outcomes for other stakeholders (universities, employers and the government).

1.1 An Introduction to Co-op.

Work-integrated-learning (WIL) and work-based-learning are terms "… used to describe a class of university programmes that bring together universities and work organizations to create new learning opportunities in workplaces" (Boud, Solomon & Symes, 2001,

p. 4). Some examples of WIL include work-based projects, unpaid work placements, apprenticeships and co-op programs. Co-op programs involve university undergraduate students undertaking full-time, paid and discipline-related employment as a structured part of their program of study. In Victoria, Australia, there are many variations in the structure of co-op programs, with some co-op programs being a compulsory requirement for a degree,[1] while other co-op programs are either voluntary or only available to top students.[2] The co-op program that is the focus of this study is a compulsory 10-month paid placement in industry, that all full-time students undertake between their second and final years of on-campus study for their four-year business degree at RMIT University.

1.2 The Research Question.

The question that this study addressed is "*What measurable value does co-op add to a degree program?*"

The research to answer this question focused on a specific degree offered by RMIT university and the impact that co-op has on the learning and the academic performance outcomes for students, and the employment outcomes for graduates of this degree. These students and graduates are two groups of stakeholders in the co-op program.

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[1] Seven out of nine undergraduate degree programs offered by RMIT Business involve a compulsory co-op program. RMIT Business is one Faculty of the university, Royal Melbourne Institute of Technology.

[2] Victorian University of Technology offers students the choice of whether or not to undertake co-op while the Swinburne University Business Information Technology program only offers co-op to its top students.

There are, however, other stakeholders that need to be considered when the measurable value of co-op is being estimated. For the university, a degree program is one of its products that contributes to the achievement of its strategic goals. The influence that co-op has on a number of the university's key performance indicators was considered, together with the cost associated with running this co-op program.

In the Australian environment where universities are under the enormous pressure of reduced government funding (Coaldrake, 1999), the long-term sustainability of co-op programs is under threat. If, however, the measurable value of co-op to employers and the government can be estimated, then the universities will have grounds to ask for more financial support from these sectors.

For employers of graduates, the issue addressed was the impact that co-op had on the companies' access to graduates and the estimated savings that were associated with graduate recruitment costs. For the government sector, the cost savings associated with the reduced reliance on government services as a result of co-op, was estimated.

1.3 Identifying Cooperative Education Program Outcomes.

While there is a shortage of evidence in Australia that supports co-op programs (Reeders, 2000), some Australian studies have been undertaken, while more extensive research has been carried out in other countries, particularly in the United States and Canada (see Pullin, 1998).

A framework used to examine the outcomes of co-op programs and their associated costs involved the identification of the major groups of program stakeholders (Cutt &

Loken, 1995). The stakeholders considered are the co-op students, the co-op graduates, the employers of co-op students and co-op graduates, universities and governments. In evaluating co-op outcomes, the current literature relating to each of these stakeholder groups was reviewed in order to identify the specific areas that still need to be addressed in answering the research question.

1.4 Learning Through Cooperative Education.

The education philosophy and practice that underpin the learning in co-op, are consistent with the belief expressed by Dewey (1938, p. 25) that 'all genuine education comes through experience'. Co-op has the potential to provide students with this opportunity of gaining experience in the workplace and of applying the theory learned in university to work place practice and problem solving. Because of their interactions with other people and their exposure to new experiences, co-op students also have opportunities to develop their generic skills[3].

Kolb (1984) argued that while experience is a necessary condition, it is not a sufficient condition for learning. Students need to be able to receive feedback and to reflect on the outcomes of their work. They need to be able to conceptualize what they have learnt, and to test out these concepts in order to understand how to apply their learning to new circumstances to bring about successful outcomes, and to avoid previously made mistakes. In other words, students need to be prepared to 'participate responsibly in' and be actively engaged in the learning process (Rogers, 1969, pp. 157-166). It is through this involvement, reflection and conceptualization

that students are able to translate their work experiences into learning outcomes and engage in deep level learning. This deep level learning occurs when experiences are integrated into the learner's body of knowledge and understanding and connections are made to previous lessons (Ramsden, 1992). In contrast, the memorization of facts and the acquisition of unrelated pieces of information characterize surface learning (Ramsden, 1992).

The co-op experience does not necessarily lead to deep level learning:

> Without the conscious reflection on how procedures are being carried out, how concepts are being formulated and understood, how organisational values impact upon decision making, and how individual practice is affected by social "rules", the learner will remain a novice, lacking the ability to transfer what is known and understood within one discipline or field into others.
>
> (Crebert, 1995, p. 4)

Whether or not co-op students experience deep level learning during their work placements is influenced by various factors. These include the learning opportunities provided by co-op employers or supervisors, the students' own commitment to and ability to learn, and the commitment and ability of university staff to support this learning (Van Gyn, 1994; Ricks, 1996).

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[3] The term 'generic skills' is used to describe skills that have the potential to be learned in one context and transferred to, or applied in others. These skills include interpersonal skills, communication skills and problem solving skills as distinct from skills that are related to a specific discipline area.

Crebert (1995) discussed the importance of workplace supervisors understanding the learning objectives of co-op and of providing the co-op students with meaningful work experiences that offer the students appropriate challenges. She also stressed the importance of students knowing how to reflect on their experiences for learning to take place. Van Gyn (1996) also discussed this importance of reflective practice in co-op. In identifying best practice in co-op as well as other forms of work-integrated-learning in Australia, Atchison et al. (1999) recognized those programs where academic staff actively supported students in their learning and guided them in their reflection. Atchison et al. (1999) also acknowledged that a critical role for co-op program managers is to negotiate appropriate work placements with employers and to clearly establish the boundaries of responsibility for each of the co-op partners.

There are, however, some major challenges that need to be overcome before these practices become more widely adopted. Despite the estimates that many Australian universities offer co-op and other WIL programs and that there is pressure to extend work place experience to all university programs (Reeders, 2000), there appears to be a lack of funding to support these programs adequately.

Academic staff involved in managing co-op and other work-integrated-learning programs in Australia have reported that they feel that their workload is high and is undervalued, and that their programs are not adequately funded (Atchison et al. 1999). This means that co-op managers may not have the time to check all work placements thoroughly enough to ensure that the appropriate learning opportunities are being provided for students. There may also not be time to inform workplace supervisors of

their responsibilities and the learning objectives of the program. This, added to labor[4] market pressures that can make finding work placements difficult, means that some placements do not support students' learning as well as they should.

Insufficient resourcing of co-op programs may also mean that there is inadequate preparation for academic mentors whose role it is to support student learning in the work place (Atchison et al. 1999). These mentors have often had to supervise large numbers of students without the appropriate time allocation. Furthermore, academics have reported that they feel that their work in mentoring co-op students is not recognized nor is it rewarded through the process of academic promotions (Weisz, 1995). This means that the commitment by academics to co-op often takes a relatively low priority in their work planning (Weisz, 1995) and that the learning in co-op and other WIL programs, is often left to chance (Reeders et al. 1999).

If change is to be brought about in the resourcing of co-op programs in Australia, then it is important to demonstrate that these programs are 'an integral part of the educational process … and therefore are competitive for scarce resources within universities' (Cutt & Loken, 1995, p. 36). To succeed in obtaining these scarce resources, it is necessary to demonstrate that the benefits of co-op programs are measurable and exceed the associated costs (Loken, Cutt & Lumsden, 1996):

> To survive within institutions, in which competition for diminishing resources is quite fierce, cooperative education practitioners must be able to state with

[4] In this context, labor is referring to the labor market not the Australian political Labor Party.

> confidence that programs operated within this format are effective and support the goals of the institution.
>
> (Van Gyn et al. 1996, p. 15)

While there is support for the underlying theory of co-op, there is an absence of empirical evidence necessary for well-informed decisions to be made about increasing resources for existing co-op programs, or whether to introduce new co-op programs into post-secondary education (Cutt & Loken, 1995; Van Gyn et al. 1997).

1.4.1 Learning outcomes for co-op students.

Learning outcomes involves many aspects including students' approaches to study, personal growth and development of understanding, and improvement in academic performance. This study focused on the effects of co-op learning outcomes in two of these areas - firstly, on the student approaches to learning and secondly, on the academic performance of students.

It has been argued that co-op can lead to students adopting a deep rather than a surface approach to learning, particularly while they are in the work place (Eyler, 1993; Fry, 1997; Graham & Stewart, 1997). This assertion, however, still needs to be supported by empirical evidence and was the first area of co-op outcomes to be addressed by this study.

The educative value of co-op can also be translated into increased self-esteem and confidence (Carrell & Rowe, 1993) as well as improved learning outcomes. Co-op students have reported that co-op was an effective learning tool for them and

that they believed that their communication, interpersonal and professional skills developed as a result of co-op (Eames et al. 1996). Measures of these developmental changes were not, however, undertaken nor were there any evaluations made of the learning outcomes for co-op students compared to those for non co-op students.

When an objective measure of learning was used to compare outcomes for co-op students with non co-op students (Van Gyn et al. 1996), it was found that co-op students scored significantly higher on the total test results than non co-op students. While these results were consistent across the three programs from which students were taken - Arts, Science and Engineering - they were not as strong when analyzed by the various test sub-categories. Co-op students did out-perform non co-op students in problem solving and in the use of science and technology, however, there were no significant differences in the other test areas that included measures of communication skills. The results of this study (Van Gyn et al. 1996) indicated, however, that the optional co-op programs examined attracted an academically superior student. It is then 'most likely that (this) student will maintain his/her superiority over the course of the program and graduate with academic results that are higher than his/her non co-op peer' (Van Gyn et al. 1996, p. 25)

Even though there have been very few studies that have measured the impact that co-op has on the academic performance of students (see Pullin, 1998), it is another aspect of educational outcomes that is of interest, particularly to academics (McDowell & Comerford, 1996).

In one Australian study, Gerrand (1995) analyzed the average academic results of a group of marketing and accounting students before and after undertaking co-op and compared these to the results of students who had elected not to participate in co-op. While this study found some empirical support for improved academic performance as a result of co-op for accountancy students this was not the case for marketing students. There were several confounding factors that could explain these results. There may have been a lower pre-co-op academic average for accountancy compared to marketing students making it easier to demonstrate an increase in academic grades as a result of co-op for accountancy students. McDowell and Comerford (1996) in another Australian study, also compared the grade-point-averages (GPA) of students before and after co-op, but did not find any significant differences. They did, however, observe small increases when the pre co-op grade-point-average was relatively low. One explanation for these results is that the program from which the co-op students were taken required a minimum academic standard of entry and therefore students were unlikely to improve on good results.

Another factor that may confound the results from a comparison of outcomes for co-op students and non co-op students, arises when the co-op program is not compulsory. Students who elect to undertake co-op may be more motivated or better academically than other students. It is therefore difficult to separate these entry differences effects from those of co-op on academic outcomes (Rowe, 1989).

The second area of the learning outcomes of co-op that this study therefore addressed was the impact that co-op has on the academic performance of students who have participated in the program compared to those who have not, given that the entry standards of the two cohorts are comparable.

While student achievement in learning and in obtaining satisfactory academic results are targeted outcomes of a degree, there is also a great deal of interest in the consequential employment outcomes and the effects that co-op can have on these (Dubick, McNerney & Potts, 1996; Kysor & Pierce, 2000; see Somers, 1995). Common measures of employment outcomes for graduates include starting salaries, graduate employability, job search time, job quality and relevance to degree specialization, job and salary satisfaction levels as well as career knowledge.

1.4.2 The employment outcomes for co-op graduates.

In reviewing the research that examines employment outcomes for co-op (Clarke & Zuhair, 1995; Dubick, McNerney & Potts, 1996; Gardener & Motschenbacher, 1997; Gardener, Nixon & Motschenbacher, 1992; Kysor & Pierce, 2000; Rowe, 1992; Van Gyn & Ricks, 1997; Wessels & Pumphery, 1995, 1996), many conflicting results were found. Attachment 1 provides a summary of the relevant employment outcome results presented in the literature.

Some studies found no significant differences between co-op graduates and non co-op graduates in graduate starting salaries (Clarke & Zuhair, 1995; Kysor & Pierce, 2000), in employment rates (Dubick, McNerney & Potts, 1996), in job

search time (Kysor & Pierce, 2000; Wessels & Pumphery, 1995) and in job satisfaction levels (Rowe, 1992; Kysor & Pierce, 2000).

The absence of any significant differences in employment outcomes between co-op graduates and non co-op graduates could be explained if other factors such as labor market conditions and differences in the academic profile of the two cohorts, confound the influence of co-op.

If the demand for graduates is greater than the supply, then employment rates for all graduates would be expected to be high and job search time would be expected to be low and not vary between co-op graduates and non co-op graduates. Under these conditions employers may also have been prepared to pay non co-op graduates the same salary as co-op graduates regardless of any differences in their work experiences. It is also possible that the non co-op graduates had some discipline-related work experience (DRWE) other than co-op, prior to graduation and that this experience was rewarded with salaries that were comparable to co-op graduate salaries.

The differences between co-op graduates and non co-op graduates in academic standards at university entry and academic performance thereafter, could also confound results making it difficult to isolate the effects of co-op. Kysor & Pierce (2000) found in their research that the co-op graduates commenced their studies with a lower university entry score than non co-op graduates but there was no difference between the GPA of the two groups throughout their university studies. Even though co-op was the likely catalyst for improved academic achievement that enabled co-op students to catch up to non co-op students academically, the

effect of co-op was not evident given the same graduate starting salaries and other employment outcomes for both graduate cohorts.

Other studies, however, found that there were significant differences between co-op graduates and non co-op graduates in employment outcomes. Dubick, McNerney and Potts (1996), Gardener, Nixon and Motschenbacher (1992) and Van Gyn & Ricks (1997) found that co-op graduates earned significantly higher salaries than non co-op graduates and that co-op was a significant factor in explaining these salary differences. It was also found that significantly more co-op graduates were employed and employed full-time than non co-op graduates (Clarke & Zuhair, 1995; Rowe, 1992; Van Gyn & Ricks, 1997) and that the job search time was significantly shorter for co-op graduates compared to non co-op graduates (Dubick, McNerney & Potts, 1996).

In some of these studies (Dubick, McNerney & Potts, 1996; Gardener, Nixon & Motschenbacher, 1992) labor market conditions and personal characteristics such as age and gender, were controlled. While these controls helped to isolate the effects of co-op on employment outcomes, these studies did not control for academic differences in students prior to making a decision whether or not to undertake co-op. Nor did these studies account for any differences in the DRWE between co-op graduates and non co-op graduates. If students who selected, or were selected, to undertake co-op had higher academic grades than other students, then it would be difficult to separate the effects of co-op from the effects of academic success on graduate outcomes. Furthermore, if employment outcomes for co-op graduates were compared to those for non co-op graduates who

completed their studies in the same year, then co-op graduates would have more DRWE at the time of comparison. This would be the case unless the non co-op graduates undertook some DRWE (other than co-op) before graduation.

Rowe (1992) addressed these problems by selecting Honours graduates of co-op and non co-op programs thereby controlling any confounding effects that may have arisen from academic differences. She also compared starting salaries for co-op graduates to salaries for non co-op graduates who had been in the workforce for a year after completing their studies. This meant that both groups of graduates had one year of DRWE. Under these conditions, there were no significant salary differences between co-op graduates and non co-op graduates. Other studies (Gardener & Motschenbacher, 1997; Wessels & Pumphery, 1996) supported this result and found that co-op had a positive influence on starting salaries but that this effect disappeared over a period of time.

In all the studies of graduate employment outcomes listed in Attachment 1, only the one by Clarke and Zuhair (1995) was set in Melbourne, Australia. The current study therefore, built on their work by examining the impact that co-op has on Melbourne graduate employment outcomes measured in terms of salary, employment rates, job search time, job and salary satisfaction and career knowledge. The study was also designed to account for labor market conditions, personal characteristics and academic standards and selected co-op graduates and non co-op graduates by year of university entry to ensure that both cohorts had the same number of years of DRWE.

1.4.3 The co-op outcomes for other stakeholders.

The other major stakeholders in co-op programs are universities that run co-op programs, employers of co-op students and graduates, and governments that contribute to the funding of university programs (Cutt & Loken, 1995).

In examining the benefits of co-op to universities in New Zealand, Eames et al. (1996) reported that the university co-op coordinators who were interviewed believed that co-op was important in attracting students to the universities offering co-op and in better preparing students for the workplace. Cutt and Loken (1995) cited similar views of co-op administrators that were reported by the Science Council of Canada. They argued, however, that while 'costs for faculty and senior administrators are significant. There is … very limited evidence to date of the … benefits enjoyed by institutions' (Cutt and Loken, 1995, pp. 32-33).

This current study examined how important co-op was to students making the decision as to which university to attend. In answering the previous questions in this study about the influence of co-op on academic outcomes and graduate employability, it was possible to address whether or not the related strategic objectives of the university that offered co-op had been achieved. Costs associated with achieving these outcomes were also estimated to enable some assessment of the cost effectiveness of co-op to be made (Loken, Cutt & Lumsden, 1996).

Given the increasing pressure on Australian universities of reduced government funding (Coaldrake, 1999), a cost benefit analysis of co-op to employers and the government would also provide a basis for deciding whether or not co-op

universities have grounds for asking these stakeholders to increase their financial support of co-op programs.

Recent studies into the benefits of co-op to employers (Braunstein, 1999; Eames & Kumar, 1997; Young, 1997) focused to a large extent on those benefits associated with the employment of co-op students. Employers, however, indicated that the benefits of co-op to them exceeded the associated costs (Cutt & Loken, 1995; Young 1997) and that a major benefit of co-op was the opportunity for them to screen potential future employees (Braunstein, 1999; Young, 1997). This means that co-op was seen by employers as part of an effective graduate recruitment strategy leading to reduced costs of recruitment and training (Braunstein, 1999; Hurd & Hendy, 1997; Young 1997) and better graduate retention rates (Hurd & Hendy, 1997; Young 1997).

The evidence that supports these employers' views has been criticized for its paucity (Cutt & Loken, 1995). The data relating to the percentage of co-op graduates retained by their co-op employers vary from 33% or less (Clarke & Zuhair, 1995; Gardener & Motschenbacher, 1997; Gardener, Nixon & Motschenbacher, 1992) to just over 50% (Dubick, McNerney & Potts, 1996). The lower the rate of return of graduate recruits to their co-op employers, the less impact co-op has on reducing graduate recruitment costs. Recruitment costs for non co-op graduates have been estimated to be between $1000 and $5000 while the costs for co-op graduates was estimated to be below $500 (Eames, Kumar, Rowe & Hitchcock, 1995; Eames & Kumar, 1997). While these estimates were specific to New Zealand and were based on two case studies, they provided a

framework for further investigations into recruitment cost differences between co-op graduates and non co-op graduates.

Other factors that have had an impact on recruitment costs are the turnover rate of graduates and the length of time that they stayed with the same employer. It has been argued that low job turnover could be associated with high job satisfaction levels (Wessels & Pumphery, 1995) and realistic career expectations (Sharma, Mannell & Rowe, 1995). While Van Gyn & Ricks (1997) found that co-op graduates rated their job satisfaction significantly higher than non co-op graduates, Rowe (1992) found no significant difference between co-op graduates and non co-op graduates in job satisfaction levels and pay satisfaction levels. Rowe's (1992) results are consistent with those of Wessels and Pumphery (1995, p. 47) who found that 'cooperative education itself had little impact on turnover.'

In estimating the impact that co-op has on graduate recruitment costs, the factors affecting job turnover, such as job and pay satisfaction levels of graduates as well as their level of career knowledge, and whether these differ between co-op graduates and non co-op graduates, were considered in this study. Furthermore, the costs to employers associated with the recruitment of graduates and co-op students were estimated, as well as the conversion rate by companies of their co-op students to graduate recruits. This enabled an assessment to be made of any savings that accrued to employers in graduate recruitment costs as a result of their retaining their co-op students as graduate recruits.

There has been very little written about the impact of co-op on the last group of major stakeholders – governments. While Wessels and Pumphery (1995, p. 46) referred to the consequence of a high job turnover rate as '…a serious cost to the economy in underutilized worker skills and needless search time', no estimation of these costs was made. Although he also did not undertake any estimations, Jacobs (1997) argued that if co-op results in a more independent labor force then this can reduce social and welfare spending.

In an effort to provide an estimation of the impact of co-op on government expenditures, this study compared the dependence of co-op students to the dependence of non co-op students on government financial support. Differences between the reliance of co-op graduates compared to the reliance of non co-op graduates on unemployment benefits were also estimated. Savings that the government made as a result of co-op were then compared to the funding that it provided to universities to run co-op programs.

1.5 A Summary of the Research Question and its Related Issues.

On the basis of the arguments presented in this chapter, the research question, "*What is the added value of a cooperative education program*?" was tackled by addressing the following issues. These issues were categorized under the three major headings that reflect the way in which the literature was divided – learning outcomes for co-op students, employment outcomes for co-op graduates, and co-op outcomes for other stakeholders.

1.5.1 The learning outcomes for co-op students.

1.5.1.a Is there empirical evidence that co-op leads students to adopt a deep, rather than a surface, approach to study?

1.5.1.b Does co-op have an impact on the academic performance of students who have participated in the program compared to those who have not, when there are comparable entry standards for the two cohorts of students?

1.5.2 The employment outcomes for co-op graduates.

1.5.2.a Are there any differences in employment outcomes – measured in terms of employment rates, job search time, salaries earned, job and salary satisfaction and career knowledge – for co-op graduates compared to non co-op graduates when both cohorts have accrued the same time in discipline-related work experience?

1.5.3 The co-op outcomes for other stakeholders.

1.5.3.a How important is co-op to the achievement of university Teaching and Learning strategic outcomes? The strategic goals considered are demand for university places, successful academic outcomes for students, the employability of graduates and the commitment to career-long learning (RMIT, 2000e). What are the costs of providing a co-op program and how much is funded by the government?

1.5.3.b What impact does co-op have on graduate recruitment outcomes for employers as measured by job and pay

satisfaction levels of graduates, and length of time with the same employer? What savings accrue to employers in graduate recruitment costs as a result of their retaining co-op students as graduate recruits?

1.5.3.c What savings in social welfare payments of Austudy[5] and unemployment benefits does the government make as a result of co-op, and how does this compare to the funding that it provides to universities to run co-op programs?

[5] Austudy is a weekly payment by the government to full-time independent students whose income is below a certain threshold. Unemployment benefits, (known as the Newstart Allowance) are paid to those who are unemployed and who seek full-time employment, provided that they are not being supported by other means.

Chapter 2

METHODOLOGY

2.0 Chapter 2 Summary.

This chapter outlines the rationale for the use of a positivist research paradigm in this study. Details are provided of the ideal research design that should be used in order to enable the effects of co-op on academic and employment outcomes to be identified and separated from the effects of other variables. This would involve the matching of the co-op graduates to non co-op graduates against variables such as university entrance score, program of study, age, the total number of years of DRWE and the labor market conditions at the time of graduate employment. Given that the major stakeholders in co-op programs were identified in Chapter 1, this chapter outlines the methods used to select the participants in this study from each of the stakeholder groups. There were, however, difficulties in meeting all the conditions necessary for the ideal research design. The discrepancies between the ideal and the actual research design are identified in this chapter and the limitations that result from these discrepancies are discussed in more detail in Chapter 6. Ethical issues relating to the collection and reporting of data are considered, as are the methods of data collection, data analysis and the interpretation of results.

2.1 The Research Paradigm.

The research question and its related issues, summarized into categories in 1.5 (pp. 23-25) are areas of research that were given a high rating of interest by a sample of co-op professionals that included members of the North American Cooperative Education Association research committee (Stull, Crow & Braunstein, 1997). Few

studies have considered all of these issues in one research project, particularly in an Australian context. By doing so, however, it is possible to inform co-op decisions, principally those related to the critical resource allocation made by each of the major stakeholder groups (Cutt & Loken, 1995).

Each category of issues has been considered in a separate chapter that includes its own review of the pertinent literature and a discussion of data collection methods specific to the area being examined. This approach has been adopted so that the results and analysis reported in Chapters 3, 4 and 5 of this report could be embedded within a framework that is relevant to the category of issues being considered. There is, however, an underlying methodological philosophy with its concomitant assumptions that support the research and its outcomes that are described in these three chapters.

2.1.1 The positivistic paradigm.

This study was based on a positivistic paradigm (as defined by Hussey & Hussey, 1997, p. 47) in which one of the major assumptions is that the outcomes of co-op as measured in this study had already occurred and were independent of any interaction with the researcher. The focus of this study was to provide empirical measures of co-op outcomes and therefore other underlying assumptions were that these outcomes are both observable and measurable. The research design took limitations of other studies into account and efforts were made to control any variables found in other studies to confound the effects of co-op on outcomes[1]. While the sample size used in this study was limited by the nature of these

controls put into place, it was still large enough to apply statistical analysis in an effort to establish a relationship between a co-op program and the measured outcomes.

This approach does not deny that a phenomenological paradigm (as defined by Hussey & Hussey, 1997, p. 47) could also be used to explore the value of cooperative education. In considering the learning outcomes of co-op it became apparent that process of learning through co-op was a very rich area for further research based on the use of a phenomenological paradigm. This research could lead to a better understanding of the nature of learning through co-op as well as a better understanding of the nature of the work experiences of co-op graduates and how these differ from those experienced by non co-op graduates.

It was therefore recognized that while both paradigms provide useful ways of understanding co-op, the use of a phenomenological approach was more consistent with analyzing the co-op processes whilst the positivistic approach was more consistent with the establishment of a relationship between program funding and the outcomes of that program. This study, generally, was therefore empirically grounded, with its methodology restricted to evaluating those co-op outcomes that could be quantified by the use of objective measurement and analyzed by using statistical tools.

A more subjective approach was, however, used in making sense of these results. Years of managing a co-op program and extensive experience on mentoring co-op

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[1] These controls included age of the participants, year of university entry and university entry scores.

students have provided some insight into the context in which the results could be interpreted. 'A common sense understanding of our world, an inclusion of a critical approach … and empirically grounded scientific studies, all contribute toward an understanding of human action' (Ricks & Mark, 1997, p. 48).

2.2 The Research Design.

The design that framed this study was based on the selection of one co-op program offered at one university located in Victoria, Australia. The choice of which program and which university was guided by an attempt to overcome some of the design problems previously identified in other studies.

2.2.1 Approaches to study design.

In order to identify whether co-op has an impact on students' approaches to study, full-time students in second, co-op and final years undertaking Economics and Finance at RMIT University were asked to participate in this study[2], which took place during April – June of 2000. While a cross-sectional rather than a longitudinal study was used, others (Van Gyn et al., 1996) have used a similar approach in the belief that year level cohorts do not differ significantly from each other and that the results reflect the effects of differing learning environments.

2.2.2 Matching co-op to non co-op graduates.

A major issue that needed to be addressed in comparing academic and employment outcomes for co-op graduates and non co-op graduates was the

[2] The researcher of this current study investigated the approaches to study of Economics and Finance students. She independently gathered and analyzed the data that later became part of a broader cross-

necessity to separate any confounding variables. In the past it had been difficult to separate the characteristics or the nature of students selecting co-op from the co-op outcomes.

If academically stronger or more motivated students selected co-op then it was difficult to identify whether academic or employment outcomes were associated with the co-op experience or with the fact that the students were academically strong to begin with. The problem was overcome in this study, by selecting graduates who had completed a degree program that included a compulsory co-op component. The academic and employment outcomes for these graduates were compared to those for graduates who had completed a non co-op degree[3] in a similar discipline area. Having similar academic entry requirements into the two degrees was recognized as important by others (Rowe, 1989; Van Gyn et.al 1996) and was also achieved in the research design of this study.

RMIT Business is the only Faculty in Victoria that offers degrees with a compulsory co-op component so graduates of the Bachelor of Business (Economics and Finance) were selected for this study[4]. Students undertake their co-op program after their second year and before the fourth (and final) year of their degree. All local Economics and Finance co-op graduates were selected

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Faculty investigation into student approaches to study and staff approaches to teaching. The results of the broader study have been reported in Weisz et al. (2001).

[3] Non co-op degrees are those that do not include co-op as an option or as a compulsory component.

[4] These degrees are offered to full and part-time students, to local and international students on-shore and to students located off-shore. Part-time students are generally exempted from the work component of the co-op requirements on the basis of recognized DRWE previously obtained. Graduates who obtained a co-op exemption were therefore excluded from the study. On-shore international students and off-shore students were also excluded from the study mainly because of the difficulty in locating them post graduation but also in an attempt to minimize any other variables that could confound the effect of co-op on academic and employment outcomes.

because they were accessible and because this enabled a comparison to be made with the results of a previous Australian study into the employment outcomes for co-op compared to non co-op Banking and Finance graduates (Clark & Zuhair, 1995).

The local non co-op graduates targeted for inclusion in this study were those who had completed a comparable 3-year degree program in Banking and Finance offered by another university in Victoria but one that did not offer co-op programs.[5]

Both co-op and non co-op degree programs have very similar academic entry requirements and both universities have a prior history of being Institutes of Technology in which a greater emphasis was, until recently, placed on teaching and providing a vocational education rather than on research.

This design meant that as many extraneous variables as possible would be kept constant in order to isolate the impact of co-op on academic and employment outcomes. The two selected groups of graduates would ideally be matched for university entrance requirements, age, academic programs and discipline areas with the major distinction between them being that one group had a co-op experience while the other one did not.

[5] These graduates, like the RMIT graduates, had been full-time local students.

Because few summer placements are offered to non co-op students studying in the discipline area of finance, it also meant that the non co-op graduates were unlikely to have any undergraduate DRWE that could confound the results.

In line with the work of Rowe (1992), the two groups of graduates would also ideally be matched by year of university entry in 1996 rather than by year of completion. This would mean that both groups would have completed three years of on-campus study and that both groups would have, at the time that this research was undertaken, the same amount of DRWE. This research, was therefore, designed so that the co-op graduates had one year of DRWE as part of their degree and six months of post degree DRWE while the non co-op graduates had eighteen months of post degree DRWE. Differences in industry experience would consequently be removed as a factor explaining the difference in performance of co-op graduates compared to non co-op graduates. The employment outcomes for co-op graduates compared to non co-op graduates would, therefore, be easier to identify without the confounding effects of differing lengths of work experience.

Given that both groups were employed in the same finance industry in Melbourne, they experienced the same labor market conditions. Inflation over the time was low and any inflationary effects on salaries and costs were regarded as negligible.

2.2.3 Identifying other major stakeholders.

The School of Economics and Finance at RMIT University was used as a case study to determine the costs of running the co-op program that the co-op graduates had undertaken.

Employers of the graduates included in the study became the employer population group from which a sample was taken to determine the cost savings that their companies could attribute to co-op.

The Australian Federal Government is the body that funds universities for their programs and provides study support for those students and unemployment benefits for those graduates who meet the criteria.

2.3 Selection of Participants.

2.3.1 Participants for the investigation into students' approaches to study.

During 2000, fifty-five second year and forty-six final year Economics and Finance students were approached in classes that are core to their studies. This method provided the best access to these students and led to response rate of 87% and 91% respectively. Twenty-nine students who were off-campus undertaking their co-op placement were sent mail questionnaires. As expected the 59% response rate of this group was lower than that of on-campus students.

2.3.2 Participants for the investigation into academic and employment outcomes.

The thirty-four local RMIT Economics and Finance co-op graduates who had undertaken their co-op year in 1998 were identified as the co-op target group, as they should have commenced their studies in 1996 and should, therefore, have complied with the design requirements. It became evident, however, that these graduates had commenced their studies between 1994 and 1997 and that even though their academic progress varied substantially, they all ended up in the co-op

year of 1998[6]. Thirty-two of these graduates were located and all agreed to participate in the study.

Gaining access to the non co-op graduates as specified in the research design was a major challenge. The first approach taken was to ask the employers of the co-op graduates to identify non co-op banking, finance or economics graduates who had commenced their studies in 1996. This led to responses from 20 graduates, not all of whom met the necessary research design criteria. A larger sample group of non co-op graduates was required and permission was sought and eventually obtained from the alumni association of the targeted university. One hundred and twenty graduates believed to have commenced their studies in 1996 were identified and 49 responses were received. Of the total 69 responses, only 39 responses were used as the remaining respondents were either mature age students, had studied in discipline areas unrelated to business or had only studied on a part-time basis and, therefore, their profile did not meet the research design requirements.

Full profiles of all respondents used in this study are provided in Attachments 5 and 6, however, a profile summary is given in Table 1 below.

Table 1: Profile of Respondents[7]

[6] Academic progress varied as some students were given exemptions for courses passed elsewhere while others had to repeat failed courses and took longer to complete their co-op pre-requisites.

	Number of respond-ents	Gender M	FM	Ave. age (years)	Number starting program in 1996	Number attending targeted university	Ave. time in work (years)
Co-op graduates	32	16	16	24.8	25	32	2.67
Non co-op graduates with no UG DRWE	26	15	11	24.4	8	15	1.77
Non co-op graduates with UG DRWE	13	4	9	24.8	1	4	4.23

From Table 1, it is evident that three major discrepancies still remained between the intended research design and the actual samples obtained. Thirteen non co-op graduates had discipline-related work experience when it was expected that they would have none. The results from this group were separated from the rest and even though the sample size was small, the academic and employment outcomes for this group were compared to the outcomes for the other two groups. Ideally, all participants should have commenced their study programs in 1996. While over 78% of the co-op graduates met this criterion, fewer than a third of the non co-op graduates did. There were also difficulties gaining responses from graduates of the university that had been matched to RMIT. Only 8% of non co-op graduates with DRWE came from the targeted university although this percentage increased significantly to 58% for the other non co-op graduates.

The limitations to the results, brought about by the discrepancies, were not sufficient to invalidate the study. The impact of having respondents from several

Victorian universities was minimal as it was established (see Table 12, Chapter 3) that the average university entrance score of 84.7 for co-op graduates was not significantly different from the average university entrance score for non co-op graduates of 82.6. The variation in program commencement and completion times by respondents became an area for further investigation and it became evident that this variation related to academic performance. Its impact on employment outcomes appeared to be minimal as the labor market in Victoria during the late 1990s was reasonably stable. These issues, however, are discussed in more detail when the academic and employment outcomes for co-op graduates and non co-op graduates are compared in Chapters 3 and 4. Furthermore, the limitations to the results brought about by the discrepancies between the intended research design and the actual samples obtained, are further discussed in Chapter 6

2.4 Methods of Data Collection and Data Analysis.

2.4.1 Ethical issues.

Ethics clearance for this study was obtained and all participants signed forms that reflected their consent to participate in the study. The responses from all participants were reported in such a way that protects the confidentiality and the anonymity of the respondents[8].

2.4.2 Data collection related to students' approaches to study.

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[7] In Australia, the same discipline area of study can be undertaken through several different degrees. It would appear from Attachments 5-1 and 6-1, however, that 98% of all respondents had a degree in commerce, business or finance.

[8] The transcripts of interviews undertaken with Human Resource Managers were not included in this study as they contained sensitive information. Excerpts from these transcripts were however, reported as they did not compromise the anonymity of the manager or the confidentiality of competitor sensitive material.

The specific technique used to measure approaches to study is discussed in Chapter 3. In brief, relevant data were collected by distributing a variation of Richardson's (1990) questionnaire to all second year, co-op and final year RMIT Economics and Finance (see Attachment 2-1).

The on-campus second and final year students were approached by a staff member with whom they were not connected, and asked in their classes whether or not they were prepared to complete a questionnaire. Time to complete the questionnaire was then allocated for those who agreed to participate. The off-campus co-op students received their invitation to participate and the questionnaire by mail and via email. Interviews were also held with a number of second year, co-op, and final year students in order to gain a better understanding of their approaches to study and learning.

2.4.3 Data collection for academic and employment outcomes for co-op and non co-op graduates.

A single questionnaire was developed so that information about academic and employment outcomes for co-op graduates and non co-op graduates could be gathered (see Attachment 2-3).[9]

Telephone interviewing of all targeted RMIT Economics and Finance co-op graduates took place during August 2000. All 32 responses were used in analyzing academic outcomes for co-op graduates while only 30 responses were

used in analyzing the employment outcomes for co-op graduates. The two remaining responses were unusable for the analysis of employment outcomes as one graduate had undertaken full-time post graduate studies and the other graduate had left Australia for overseas travel.

Permission from all 32 respondents was sought for the researcher to use relevant data that she had collected in 1998 and 1999 as part of her program management duties. The information collected included the work histories and salaries of the respondents in their co-op and post co-op years.

Ideally, the same method of data collection used for co-op graduates should also have been used for non co-op graduates; however, telephone access to non co-op graduates was not feasible. Instead, copies of the questionnaire were emailed to the non co-op graduates working for the same employers as the co-op graduates in the study[10]. Responses were anonymously returned electronically. These non co-op graduates were also invited to attend a focus group to discuss their graduate employment outcomes in more detail.

More questionnaires were mailed out in February 2001 from the alumni office of the non co-op university, with a response deadline request of one week. Of the total of 49 responses from non co-op graduates received, 39 responses were usable and included in the study, as previously discussed. The responses were

[9] Because this questionnaire was used to elicit information that is relevant for outcomes that are discussed in chapters 3, 4 and 5, the data collection method is discussed in detail here and only reference to this data collection method is made in the other chapters.

determined to be usable if they were complete, and if the respondents' characteristics such as age, university entry score and field of study matched those of the co-op graduates. A further three responses that came in between April and July of 2001 were considered to be too late for inclusion in the results.

All the co-op graduates were interviewed again in February 2001 in order to address the data inconsistencies that arose from having a seven-month lag between the time of gathering the data from the co-op graduates compared to the non co-op graduates. This ensured that their information, particularly pertaining to their employment, was updated and could be used as a valid comparison to the data relating to non co-op graduates. The original study design was also adjusted as a result of the time delay in data collection so that both groups of graduates were expected to have two years rather than eighteen months of DRWE. Again, there were some discrepancies between the intended and the actual research design. The co-op graduates had, on average, two-and-a-half years of DRWE while one group of non co-op graduates had just under two years of DRWE, and the other had approximately four years of DRWE. The impact of the differing lengths of DRWE on employment outcomes is discussed in detail in Chapter 4.

All quantitative results were collated using Excel spreadsheets and all transcriptions were checked for accuracy.

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[10] Human Resource Managers in these companies had been approached and their support elicited. They then agreed to identify the target group of non co-op graduates and email the questionnaire to them on my behalf, thereby maintaining the anonymity of the graduates.

The method of data collection used for measuring approaches to study, academic and employment outcomes, is consistent with the positivist paradigm that frames the study. So too is the method used to collect the financial data relevant to other major stakeholders making decisions pertaining to co-op.

2.4.4 Data collection from university, employer and government stakeholders.

Relevant results reported in Chapters 3 and 4 were used to identify how co-op helped these stakeholders achieve related goals. Historical records were used to gain financial data on the funding and costs of co-op for the RMIT School of Economics and Finance, the co-op program provider. Interviews were held with several Human Resource Managers of companies that employed both co-op graduates and non co-op graduates to determine recruitment costs for graduates and for co-op students. The Australian Federal Government internet site was accessed to obtain data related to welfare payments.

2.4.5 Data analysis.

Parametric statistical tools were used to evaluate quantifiable differences in measures of academic and employment outcomes for co-op graduates and non co-op graduates. This is consistent with similar work undertaken by others in the field (Gardener, Nixon & Motschenbacher, 1992; Rowe, 1992). More detailed methods of data analysis are discussed in the relevant chapters.

2.4.6 Interpretation of results.

Interview material, results from focus groups and non-quantitative responses to the questionnaires were recorded and analyzed as a means of providing a context for the quantitative results obtained. This is consistent with work undertaken by

Deves (1998) and is another information source that contributed to the application of the research-practitioner model (Ricks and Mark, 1997) used to frame the interpretation of the quantitative results.

2.5 Concluding Comments for Chapter 2.

This chapter described the methodological philosophy that underpins the study into the identification and measurement of the added value of a co-op program to its major stakeholders. The intended research design, methods of data collection and the approach to data analysis were discussed, and some discrepancies between the intended and actual research design relating to the selection of co-op graduates and non co-op graduates were identified. Ideally, the co-op graduates needed to be matched to the non co-op graduates, against a number of criteria, so that the results would not be confounded. These criteria were:

- The year of entry into university was selected to be 1996.
- One university with a compulsory co-op program, was selected as the source of co-op graduates and a similar university, but one that does not offer co-op, was selected as the source of non co-op graduates.
- Similar academic university entry requirements.
- Similar discipline areas of study.
- Similar age of co-op graduates to non co-op graduates.
- The co-op graduates had undertaken a compulsory co-op program.
- Both co-op and non co-op graduate groups would have a total of two years DRWE.
- Both co-op and non co-op graduate groups needed to face similar labor market conditions after graduation.

Not all the conditions associated with the intended research design were achieved and when the profiles of the respondents were analyzed, the following observations were made.

- While many graduates entered their study program in 1996, this was not the case for all graduates. The implications of this requirement not being met are discussed in Chapter 6.
- All the co-op graduates came from the same university, however, the non co-op graduates came from several universities. The main problem with including graduates from several universities is that each university may have set different entry requirements and different academic standards. The academic university entry scores for co-op graduates were, however, very similar to those for non co-op graduates, hence the impact of having graduates from a number of universities was reduced.
- Ninety-eight percent of graduates had completed a degree in commerce, business, economics or finance.
- The average age of co-op graduates was very similar to the average age of non co-op graduates.
- All co-op graduates had undertaken a compulsory co-op program.
- Some non co-op graduate had undergraduate DRWE and a total of four years in the labor force. The results for this group were separated from the rest. While the size of this group was small, it was still possible to analyze the academic and employment outcomes for this group and compare them with the outcomes for the

other graduates – both co-op and non co-op – who had approximately two years of DRWE. The limitations involved in this comparison are discussed in Chapter 6.

- Both co-op and non co-op graduate groups faced similar labor market conditions after graduation.

The problems that arose when the intended criteria were not met are discussed in more detail in Chapters 3 and 4. Details of the research methods that relate to the specific sections of the study are also included in the Chapters 3, 4 and 5. These chapters deal consecutively with the learning outcomes for co-op students and graduates, the employment benefits for co-op graduates, and the impact of co-op on other major stakeholders.

Chapter 3

THE LEARNING OUTCOMES FOR CO-OP STUDENTS AND GRADUATES

3.0 Chapter 3 Summary.

This chapter defines the learning outcomes for co-op students in terms of the approaches to study that they adopt. The use of Richardson's Approaches to Study Inventory to measure these approaches is described and the transitions that students make in their approaches to study from second year to co-op to final year are discussed. The results of interviews held with second year, co-op, and final year students are also reported.

The learning outcomes for co-op graduates are defined in terms of changes in academic performance from their second year to their final year of undergraduate university study. These changes in academic performance from second year to final year which are measured using an Academic Performance Index, are compared to the changes in academic performance of non co-op graduates from their second year to their final year of undergraduate studies. Tests are undertaken to determine whether it is the co-op experience that is significant or whether age, gender, low second year results and university entrance scores are significant in explaining the difference between co-op graduates and non co-op graduates in changes of their undergraduate academic performance from second year to final year.

3.1 Learning in Cooperative Education.

It has been argued that significant learning is acquired through doing and that learning is facilitated when the student participates responsibly in the learning process

(Rogers, 1969; Knowles, 1984). In the context of the Experiential Learning Model (Kolb, 1984), this learning process also involves the evaluation of outcomes and feedback in order to develop new concepts and test new behaviors (see Figure 1).

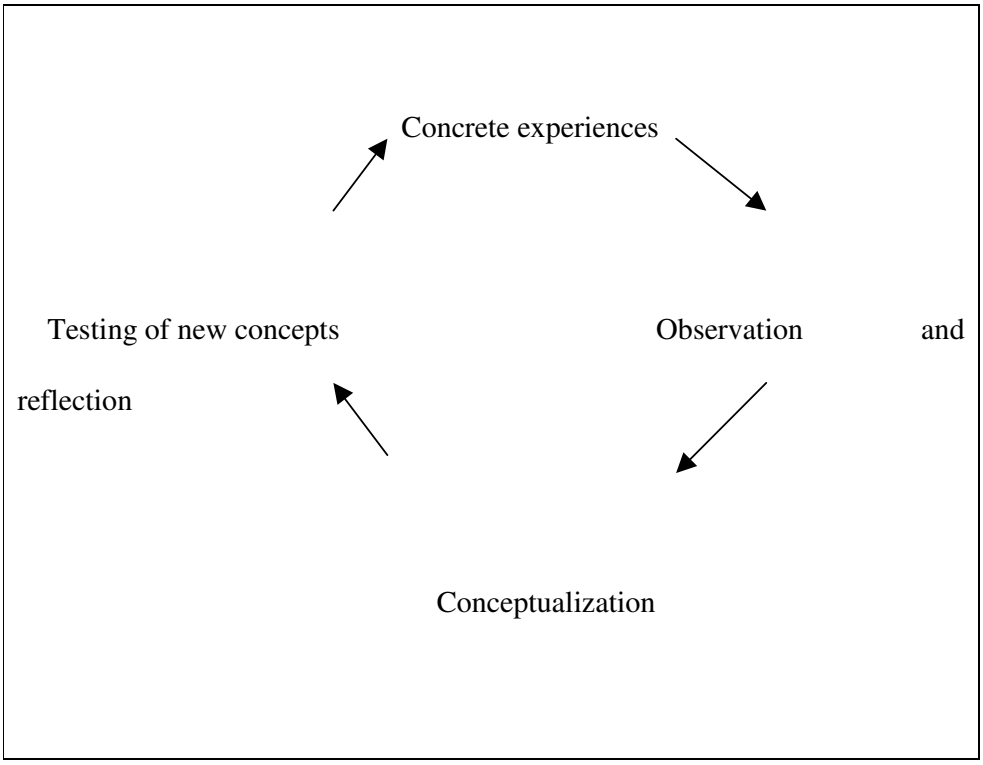

Figure 1. Adapted from Kolb's (1984) Experiential Learning Model

This model is very useful in explaining how learning in co-op can take place (Van der Vorm, 1995). Students in the workplace have the opportunity for a wide range of experiences. They can apply their knowledge to practical problem-solving, and usually receive feedback from their colleagues and workplace supervisors. This provides them with opportunities to reflect on how their actions need to be modified in order to bring about more desirable outcomes. For the learning cycle to be complete, co-op students need to use their reflections to develop new concepts and generalizations about what they have learnt. These concepts can then be tested by

trialing new behaviors in the workplace and then the students engage in the learning cycle once again. It is through this learning process that these co-op students have the opportunity to practise making connections between the various areas of their theoretical knowledge and their workplace experiences (Van der Vorm, 1995).

This learning has often been referred to as 'deeper level' learning or 'transformational learning' (Entwistle, 1997, p. 17) where students become more critical in their thinking about the subjects that they are studying. In an effort to 'transform information into a process of reaching personal understanding', students engage and interact with the material that they are learning. They seek connections with other concepts that they have developed or practices that they have experienced. Making these connections and understanding how these connections operate, particularly when there are variations in the learning experiences, enables the students to take appropriate and effective action even in unfamiliar situations (Bowden and Marton, 1998).

While co-op programs have the potential to lead to this transformational learning, the supporting evidence for learning in co-op has generally taken the form of outlining the conditions necessary for deep level learning and evaluating whether or not the program under review has met these conditions. (Crebert, 1995; Garrick & Kirkpatrick, 1998; Hughes, 1998).

In one such example, Graham and Stewart (1997) described how the business-based project which is a common characteristic of co-op programs, met the conditions for

deep level learning. They, like others, however, stopped short of testing which approaches to learning that students in the workplace actually used.

3.2 Measuring Approaches to Learning.

In analyzing student approaches or orientations to learning, Marton and Saljo (1997) referred to two fundamental levels of information processing. One is a *surface level processing* where students focus on being able to reproduce the required material often using a rote learning strategy. The other is a *deep level processing* where students focus on understanding, challenging and integrating the content of what they are learning. These orientations have since been subsumed in the broader categorizations of *reproducing* and *meaning* orientations identified by Entwistle and Ramsden (1983). A tool to measure these orientations, the Approaches to Studying Inventory, was developed by Entwistle and Ramsden (1983) and a modified version of this, a short form devised by Richardson (1990), has been used to measure the approaches to learning used by students in the workplace (Weisz et al. 2001).

3.3 The Impact of Co-op on Academic Results.

Whether or not the co-op experience encourages students to adopt a meaning orientation to learning, there is still an unanswered question about the impact that co-op has on the academic outcomes for students once they have returned to on-campus study. Given that students themselves believe that co-op is 'an effective learning tool …[which gives them] a good opportunity to link classroom theory to practical work' (Eames et al.1996, p10) it could be expected that co-op would have a positive influence on the academic results of returning students. In a study undertaken by McDowell and Comerford (1996) that compared the GPAs for students pre and post co-op, it was found that the results for many students did not improve after co-op.

Where there was an improvement, the results were generally statistically insignificant and there were instances where the GPA for some students actually fell post co-op. The absence of any significant increase in post co-op results could be explained by the high academic standard of the students prior to co-op, making any large GPA improvement unlikely. The study by McDowell and Comerford (1996) did not, however, address the issue of what impact co-op has on students with low GPAs nor did it compare the academic performance of co-op students to non co-op students.

Where the academic performance of co-op students and non co-op students has been compared, Gerrand (1995) found that for Accountancy students, a higher percentage of co-op students than non co-op students had final year results that were better than those for the first two years of study. However, the converse occurred for Marketing students, with a higher percentage of non co-op students compared to co-op students recording final year results that were better than the results for the first two years of their program. This anomaly in results can be explained by the lack of account being taken of any differences in entry standards between all the cohorts of students or the differences between the early-year grades from which the improvement was measured. Others (Van Gyn et al.1996) found that any differences in academic results at graduation between co-op students and non co-op students could be explained by the different entry standards of the two student cohorts. When these different entry standards were controlled and the two cohorts of students were tested twice over two-and-a-half years using an objective measure of college outcomes, it was found that the co-op students did out-perform the non co-op students. The overall differences were, however, lower than expected (Van Gyn et al., 1997). This raises the question that was addressed by this current study, of how the academic performance at university

varies between co-op students and non co-op students if entry standards for the two cohorts of students are comparable.

3.4 The Learning Issues.

The learning outcomes for co-op students were identified in this current study by answering the following questions 3.4.1 and 3.4.2[1]:

3.4.1 Is there empirical evidence that co-op leads students to adopt a deep rather than a surface approach to learning? In answering the question in this study, two other issues surfaced:

3.4.1a Do students' approaches to learning while studying on campus differ from those adopted in the workplace?

3.4.1b Do more students, post co-op compared to pre-co-op, use a deep approach to learning?

3.4.2 Does co-op have an impact on the academic performance of students who have participated in the program compared to those who have not, when there are comparable entry standards for the two cohorts of students?

3.4.2a Does the effect of co-op on the academic performance of students depend on the student's gender?

3.4.2b Does the effect of co-op on the academic performance of students depend on the academic achievement of students pre-co-op?

[1] These questions are re-statements of Section 1.5.1 (pp. 23 & 24)

3.5 Method of Data Collection for Learning Outcomes.

The research into the learning outcomes for co-op students was divided into two stages: the first measured the effect of co-op on students' approaches to study while the second measured the effect of co-op on the academic performance of students.

3.5.1 Stage 1- Measuring the effect of co-op on students' approaches to study.

Richardson's (1990) short form of the Approaches to Study Inventory was used in this study (see Attachment 2-1). The Approaches to Study Inventory contains 32 questions related to the four constructs used to define *meaning orientation* and the four constructs used to define *reproducing orientation* (see Table 2). A five point Likert scale was used and students were classified as scoring *high* if the sub-scale mean was 3.5 or above. Students scored *high* on the orientation overall if the sub-scale means totaled 14 or more. The percentage of students scoring *high* for each orientation was then calculated (Richardson, 1990).

Interviews were also held with two students from each year in order to gain a better understanding of what factors influenced their choice of approach to study (see Attachment 2-2).

Table 2: Defining *Meaning* and *Reproducing* Orientations (Richardson, 1990).

Meaning Orientation	
Comprehension	Readiness to map out subject area and think divergently
Deep approach	Active questioning in learning
Use of evidence and logic	Relating evidence to conclusions
Relating ideas	Relating to other parts of the course
Reproducing Orientation	
Fear of failure	Pessimism and anxiety about academic outcomes
Improvidence	Over-cautious reliance on details
Surface learning	Preoccupation with memorisation
Syllabus boundness	Relying on staff to define learning tasks.

3.5.2 Stage 2: Measuring the effect of co-op on the academic performance of students.

In line with methods used in other studies (Gerrand, 1995; McDowell & Comerford, 1996) but controlling for entry standards, the academic results of co-op graduates were compared to those of non co-op graduates.

Each graduate was asked to complete a questionnaire (see Attachment 2-3) that included questions about their second year and final year academic results and their university entry scores[2]. Data on age and gender of the respondent were also collected.

All the academic results were converted to an academic performance scale thereby establishing a basis of comparison between students at different universities and at

various stages in their program (Weisz, 1999). Table 3 below outlines the method used to calculate the academic performance index.

Table 3: Calculation of the Academic Performance Index

Grade boundaries measured as a percentage.	**Letter grade that corresponds to the mark boundaries.**	**Contribution to the Academic Performance Index.**	**An example of a student's results measured by the number of grades achieved in each category for the eight courses typically undertaken in one academic year.**	**The Academic Performance Index (API)***
80 - 100	High Distinction (HD)	4	2	4x2 =8
70 - 79	Distinction (DI)	3	1	3x1 = 3
60 - 69	Credit (CR)	2	3	2x3= 6
50 - 59	Pass (PA)	1	2	1x2 =2
<50	Fail (NN)	-1	0	-1x0 = 0
Total			8	API = 19

*The Academic Performance Index, a variation of the grade point average, was scaled by eight divided by the number of courses undertaken. The standard number of courses undertaken in an academic year is eight, therefore this scaling was used for those students in this current study whose number of courses undertaken in an academic year varied from the standard eight. This process standardized results so that valid comparisons could be made between results for students progressing at different rates or attending different universities.

[2] The questionnaire also sought to gather data on employment outcomes for both co-op and non co-op graduates. This is discussed in detail in chapter 4.

3.6 Results and Discussion.

3.6.1 Stage 1: Measuring the effect of co-op on student approaches to study – the results of the Approaches to Study Inventory and the students' interviews.

The number of respondents from each year is given in Table 4. While the overall response rate was over 80%, the response rate from students out on co-op was much lower at close to 60%.

Table 4: The Number of Respondents from Economics and Finance

	Second year students	**Co-op students**	**Final year students**	**Total**
Number of respondents	48	17	42	107
Percentage of target	87	59	91	82

The results of the Approaches to Study Inventory for Economics and Finance students are given in Table 5 and a breakdown of the percentage of students who scored *high* on each of the orientation sub-scales is given in Table 6. Since the responses to the Approaches to Study Inventory were made on a Likert scale, it was appropriate to subject them to an analysis of variance (see Attachment 7). A summary of these results is presented in Table 7.

Table 5: Percentage of Respondents Scoring *High* on each Orientation[3]

	Meaning Orientation (MO) *%*	**Reproducing Orientation (RO)** *%*
Second Year	50	42
Co-op	53	18
Final Year	56	46

Table 6: Percentage of Respondents Scoring *High* on each Orientation Sub-Scale.

Year & (No of respondents)	**Meaning orientation**	**Deep approach**	**Relating ideas**	**Use of evidence and logic**	**Comprehension learning**
Second year (48)	50	54	67	40	15
Co-op (17)	53	29	53	41	24
Final year (42)	56	51	66	37	17
	Reproducing orientation	**Fear of failure**	**Reliance on detail**	**Surface approach**	**Syllabus boundness**
Second year (48)	42	31	21	40	69
Co-op (17)	18	12	18	41	65
Final year (42)	46	39	29	39	76

[3] It is feasible that a student may score *high* on both a MO and a RO. This explains why the total of MO + RO for any year level is often more than 100%. It also suggests that students adopt different learning strategies according to the environment in which they are studying.

Table 7: Analysis of Variance Results

Year Level &	F Value	P Value
Meaning orientation	3634	2.2E-135
Deep approach	38.5	2.88E-09
Relating Ideas	61	2.64E-13
Use of evidence & logic	18.5	2.65E-05
Comprehension learning	1.58	0.210092
Reproducing orientation	2854	6E-125
Fear of failure	1.662	0.1987
Reliance on detail	4.817	0.02927
Surface approach	16.27	7.7E-05
Syllabus boundness	70.39	6.8E-15

From Table 5 there is a clear indication that the co-op experience reduced the percentage of students who adopted a RO to study. This is supported by the analysis of variance results presented in Table 7 that show that there is a significant difference between year levels in the use of a RO by students.

An analysis of results in Table 6 indicates that a high percentage of all students scored *high* on *Syllabus Boundness* although the percentage of co-op students was somewhat smaller than the percentage of students in other years. The indications that a large percentage of co-op students are syllabus bound is quite surprising given that the syllabus provided to the students is very broad in its requirements. Students, however, completed the Approaches to Study Inventory very early in

their co-op year. In future studies, the impact of a particular year on the change in students' approaches to study may become more evident if students are tested at both the beginning and at the end of their academic year.

The results in Table 6 also reveal that there is a smaller percentage of co-op students compared to second year and final year students who scored *high* on the *Fear of Failure* and the *Over Reliance on Detail* scales. These results are consistent with the co-op literature that outlines the importance of creating a safe and supported learning environment where students are encouraged to take risks and to trial new behavior (Hughes, 1998). An analysis of variance of the individual *Fear of Failure* scores (Table 7), however, showed that there are no significant differences between years in the students' measures of *Fear of Failure*. This apparent inconsistency in the results requires further investigation with larger sample sizes.

The smaller percentage of co-op students compared to second year and final year students scoring *high* on the *Over Reliance on Detail* suggests that these students took a more over-arching view of their learning that facilitated their making connections. This is also consistent with the analysis of variance results in Table 7 and the theory of how learning in co-op takes place (Van der Vorm, 1995).

The results also indicate that on-campus students were likely to adopt a RO to study (Table 5) which was largely influenced by a strong *Syllabus Boundness* (Table 6). The dramatically reduced likelihood of students using a RO throughout their co-op experience did not carry over once the students returned to on-campus

study and there was an even greater likelihood of final-year students using a RO compared to second-year students. Indeed, three out of the four sub-scales were higher for final year compared to second year students (Table 6).

Students out on co-op were expected to use a *Meaning Orientation* in their learning. The data in Table 5 indicates that there is a slightly higher percentage of co-op students compared to second year students who scored *high* on MO although the results for the *Deep Approach* and *Relating Ideas* sub-scales are not consistent with this trend. Furthermore, few students from any year level scored *high* on the *comprehension learning* sub-scale although the greatest representation came from co-op students. The analysis of variance results in Table 7 indicate, however, that there are no significant differences in the actual *comprehension learning* scores between second year, co-op and final year students. While these results may reflect an understatement of the MO and sub-scales for co-op students, given that the testing occurred very early on their co-op year, it may also be that the learning support that helps co-op students translate experiences into learning outcomes may need to be strengthened.

> It may also be the case that MO is more intractable to change, being more strongly linked to learners' pre-dispositions or abilities, or the product of an attempt to read the more enduring or generalised features of the learning environment. By contrast, RO appears more amenable to change, perhaps having more of the quality of a repertoire of interpretations and behaviours that are evoked by readings of particular learning tasks (Weisz, et al. 2001,p. 203)

The comments from students who were interviewed (Attachment 2-2) did, however, clarify what factors encouraged them to adopt either a MO or a RO. All the students described how they often adopted a RO to study in second year and were motivated by 'learning to just pass the exams, test or an assignment'. The students who had experienced co-op described how they had changed their approach to learning because of the co-op experience and looked forward to adopting a MO once they returned to on-campus study. They also clarified why they reverted back to using a RO for some final year subjects.

One female co-op student said:

> (With one second-year subject) I found that if you had done the work and you'd looked at what was required of you, then you'd be able to get the answers.

> I suppose I expect more out of what I'm going to do next year just because I have seen the benefits (of co-op) for you if you really know your stuff. Often for exams, you just cram and forget it, but I know now that once you learn something, if you keep it in your head, it's really worthwhile… I find that if it's not crammed at the last minute, it stays in your head more and I find that if I work on it over a period of time I'm more likely to remember it.

A male co-op student also described how he adopted a MO in the workplace as opposed to adopting a RO at university:

> ..When you're in the workforce, ..you look at (learning) more on a practical perspective and you think well, OK, this relates to this and this is how something is affected by something else, and you tend to analyse it more and look at how everything is affected on the whole rather than just learning that and that's the end of it. I guess if you look at people how they forget what they learnt last year at uni and I think …I've studied two years …and I haven't really gotten the most out of them.

The final year students interviewed commented on what influenced them in which approach to study they adopted.

The female final year student said:

> ..The two things that I see as important when looking to be motivated …are the lecturer and the practicality of the subject. If the lecturer isn't enthusiastic or …has been teaching the same ..syllabus for the past ten years, then I think it flows through the class. If someone's really enthusiastic about it, it …makes you want to go home and read …and relate (the reading) to what they've said…

A male final year student went into even more detail:

> I guess lecturers tend to stick to the course material and read off the lecture notes and just go through on their merry way and don't tend to diverge from the straight line. …But I understand it's hard to go into great detail in other things and you're not going to get through all the material…
>
> I guess it also comes back to ….when there are smaller numbers in the subject you have a greater facility to ask questions than (in) larger lectures.

These comments from the students support what others (Kember & Gow, 1994; Trigwell et al. 1995; Weisz et al. 2001) have said about the influence of teaching orientation on student learning.

In analyzing the results relating to the percentage of students scoring high on a MO (Table 5), there was, over the years, an upward trend in the likelihood of students adopting a MO. This likelihood was also greater than that of students adopting a RO, at each year level within the program. The results, however, were not strong in supporting the contention that co-op is more likely than on-campus study to lead to transformational learning (Van der Vorm, 1995). More final year students than co-op students adopted a MO and fewer co-op students than second year or final year students were likely to relate ideas or to adopt a deep approach to learning. Co-op students, however, were somewhat more likely than others to learn for understanding (Table 6).

The lack of strength in the results pertaining to the students adopting a MO could be explained if the MO test is more situation-specific than the test for RO.

Furthermore, the Approaches to Study Inventory may not be as applicable to workplace learning as it is to learning in a university environment. An alternative explanation rests on the learning environments that students experience in the workplace.

While co-op has the potential to promote deep level learning (Graham and Stewart, 1997), there has been great variability in the co-op environment and the consequent experiences that shape students' learning (Reeders et al. 1999; Reeders, 2000). Work tasks have ranged from the repetitive and menial to those which have challenged the student's thinking and resourcefulness. There have also been differences in the quality of mentoring by both the workplace and academic supervisors who, in promoting a MO in students, need to provide useful feedback, a safe learning environment and guidance in reflection (Reeders et al., 1999; Rogers, 1969).

How then in this current study, did the influence of co-op on students' approaches to study, translate to the changes that took place in the academic performance of students returning to on-campus study?

3.6.2 Stage 2: The impact of co-op on academic results.

All quantitative results related to the academic outcomes for co-op graduates and non co-op graduates are presented in Attachments 5-1 and 6-1. Thirty-six out of the 39 non co-op graduate responses relevant to this section were complete and therefore, included in the data analysis.

University results as measured by the Academic Performance Index for co-op graduates and non co-op graduates, are detailed in Attachment 8 and a summary is presented in Table 8. The non co-op graduates were divided into two groups: those with undergraduate DRWE and those with no undergraduate DRWE. The intended design of this current study was that non co-op graduates would not have any undergraduate DRWE. There were, however, 12 non co-op graduates with this undergraduate DRWE, even though they had not participated in a formal co-op program. It was decided that despite the small sample size, the results for this group would be reported and any trends in the data identified although the data for this group were excluded from any regression analysis[4].

A regression analysis was undertaken (see Attachment 13-1) to determine the impact of co-op and second year results on the final year results of students. It was found that the variation due to the regression was greater then random effects ($F=13.65$, $p=0.00005$) and that second year results were significant in explaining the final year results ($b=0.51$, $p=0.00002$). To analyze these data further and in line with the statistical analysis of the differences in academic performance between co-op graduates and non co-op graduates used by Rowe (1989), the average academic results were calculated and tests for differences of means were used.

[4] This division is however, more relevant when the graduate employment outcomes are examined and is therefore discussed in more detail in chapter 4.

Table 8: Summary of Academic Results for Co-op Graduates and Non Co-op Graduates

	No	Mean age of cohort	The mean API & SD for Second year university academic results	The mean API & SD for final year university academic results	t-Test for paired sample means	Pearson's correlation coefficient
Co-op graduates	32	24.8	13.6 (5.90)	17.5 (5.68)	t=3.38 (p=0.0009)	r=0.37 (t=2.20) (p>0.01)
Non co-op graduates with no UG DRWE	24	24.4	17.72 (6.42)	20.2 (5.85)	t=2.74 (p=0.0058)	r=0.74 (t=5.19) (p<0.01)
Non co-op graduates with UG DRWE	12	24.8	19.0 (5.27)	21.7 (5.93)	t=2.36 (p=0.0188)	r=0.76 (t=3.66) (p<0.01)

The results from Table 8[5] indicate that there were no significant differences between co-op graduates and the non co-op graduates in their average ages of between 24 and 25 years old (See Attachment 8-2). The undergraduate academic performance in both second and final years of non co-op graduates was higher than co-op graduates with the highest performing group being non co-op graduates who had undertaken some degree-related part-time or casual work while studying. For all groups, final year results were significantly higher than second year results with the greatest difference being for the co-op group. The improvement in results for non co-op graduates with undergraduate DRWE was, however, greater than for non co-op graduates without this experience. It would therefore seem that some undergraduate DRWE helped to improve their academic

[5] t-tests for differences of means were used instead of ANOVA since not all the underlying assumptions for ANOVA were met.

performance from second year to final year, however, co-op had a greater effect than other forms of DRWE.

Of even greater interest is that the correlation coefficient for the co-op results was almost half of the correlation coefficient for non co-op results. This indicates that there was a strong positive relationship between final year and second year results for non co-op graduates, with low results in final year associated with low results in second year, and high results in final year associated with high results in second year. For co-op graduates, this relationship was very much weaker suggesting that there were other factors that explain the significant increase in final year compared to second year results. Arguably, this was the co-op experience.

These results are consistent with previous findings (Weisz, 1998) where the academic performance of Economics and Finance co-op students was compared to that of a group of Economics and Finance students who had been granted an exemption from co-op. While the results for both cohorts of students were not significantly different for second year, the final year result of a Distinction average for the co-op group was significantly higher than the Credit average achieved by those with a co-op exemption.

While the results in Table 8 provide support that the co-op experience led to improved academic results in final year, few studies have investigated whether post co-op work experience is a factor that explains this improvement. The change from second year to final year results for co-op graduates was therefore examined in more detail in Table 9 below. Although the sample sizes are small,

three groups of post co-op, final year students were identified: those who remained in full-time discipline-related work, those who took on part-time discipline-related work, and those who did not return to any discipline-related work but may have taken on other work instead.

Table 9: The Influence of Post Co-op Work Experience on Final Year Academic Performance.

	No	**The mean API & SD for second year university academic results**	**The mean API & SD for final year university academic results**	**Pearson's correlation coefficient**
Full-time DRW post co-op	14	13.36 (5.74)	15.26 (5.52)	r=0.70 (p<0.01)
Part-time DRW post co-op	10	13.43 (6.16)	17.85 (6.25)	r=0.06 (p>0.10)
No DRW post co-op	8	14.15 (6.60)	20.83 (3.60)	r=0.35 (p>0.10)

From the data in Table 9 it can be seen that the correlation between the final year results and second year results is not statistically significant for students who take on part-time or no work post co-op. This suggests that the influence of co-op on final year academic results is more evident for these students than for final year students who are also working full-time. Final year students who are not working or only working part-time post co-op, have the benefit of their co-op experiences yet they also have more time in final year to focus on their academic work

compared to those students who are working full-time. Given the small sample sizes, this is an area that needs to be further investigated in the future.

There have also been few studies that have investigated whether there is a gender bias in the impact that co-op has on academic outcomes. Table 10 provides a summary of data on academic results by gender from Attachment 9 that enabled this issue to be further explored.

Table 10: Gender Differences and Academic Results for Co-op and Non Co-op Graduates

	No	**The mean API & SD for second year university academic results**	**The mean API & SD for final year university academic results**	**t-Test for paired sample means**	**Pearson's correlation coefficient**
Female co-op graduates	16	12.97 (5.20)	17.82 (5.05)	t=2.56 (p=0.0109)	r=-0.09 (t=-0.35) (p>0.01)
Male co-op graduates	16	14.20 (6.63)	17.11 (6.40)	t=2.22 (p=0.0211)	r=0.68 (t=3.44) (p<0.01)
Female non co-op graduates	17	19.36 (4.19)	20.64 (5.33)	t=1.50 (p=0.0767)	r=0.75 (t=4.44) (p<0.01)
Male non co-op graduates	19	17.04 (7.22)	20.75 (6.40)	t=3.53 (p=0.0012)	r=0.78 (t=5.16) (p<0.01)

From the data in Table 10, it can be seen that for all graduates, their average academic results in final year of university were significantly higher than their

average academic results in second year of university. The greatest percentage increase in these average results from second year to final year of university is for female co-op graduates (37.4%) although male graduates showed an improvement in their average university results whether they had undertaken co-op (average results increased by 20.5%) or not (average results increased by 21.8%). Using regression analysis (Attachment 13-2), gender and co-op were not found to be significant factors in explaining the differences between final year and second year results. An examination of the correlation coefficients in Table 10 indicated, however, that co-op did have an impact on final year results for the female co-op graduates. There was a statistically insignificant but low negative correlation between second and final year university results for female co-op graduates ($r = -0.09$, $p > 0.01$). This means that the final year results were higher than, but not dependent on, the second year results. There was, however, a statistically significant and strong positive correlation between second and final year university results for each of the other groups of graduates (Table 10). This indicates that there was a relationship between the final year and the second year university results for male co-op graduates and for all non co-op graduates. One plausible explanation for these results is that the impact of co-op on academic results is greater for females than for males.

The second explanation for these results is related to the greater influence of co-op on students who have lower academic performance pre co-op compared to other students. In this current study, co-op had the greatest influence on the cohort of female co-op graduates who also had the lowest average academic performance index in second year. To test whether gender or second year results

was more important in determining the strength of the co-op experience, the test for difference in means was once again applied. This time, the university results achieved by the graduates were categorized into either high or low academic achievement[6] (See Table 11 that summarizes for each group of graduates, the Attachment 10 results categorized by high and low academic achievement).

Table 11: The Relationship Between Academic Achievement in Second Year and the Influence of the Co-op Experience.

	No	**No of female (FM) & male (M) co-op graduates**	**The Mean API & SD for second year university academic results**	**The Mean API & SD for final year university academic results**	**t-Test for paired sample means**	**Pearson's correlation coefficient**
Co-ops with low second year results	16	FM= 9 M = 7	9.0 (3.17)	16.9 (5.63)	t=5.55 (p=0.00003)	r=0.41 (t=1.66) (p>0.05)
Co-ops with high second year results	16	FM=7 M=9	18.2 (4.14)	18.0 (5.28)	t=-0.1007 (p=0.4606)	r=0.56 (t=2.62) (p<0.05)

As previous studies have found (McDowell and Comerford,1996), when students have high academic performance in second year the influence of co-op on academic results in final year is negligible, given that it is difficult to improve on already very high scores.

The data for "Co-ops with high second year results" confirmed this with no statistically significant differences in the credit-to-distinction results in both pre

[6] An Academic Performance Index of 12 or below defined low academic achievement while an Academic Performance Index of above 12 defined high academic achievement. The precedent for the use of this method is in Weisz (1998)

and post co-op ($t=-0.1007$, $p=0.46$) and with a statistically significant correlation coefficient ($t=2.62$, $p<0.05$).

For students with low second year results, the co-op experience seemed to have had a dramatic effect in raising the pass average performance scale in second year to almost a distinction average in final year. Again, the relationship between second year and final year results was not significantly different from zero therefore supporting the role of co-op in bringing about this change. The correlation between second year and final year results was positive and appeared to be relatively strong, however, it was not significantly different from zero ($t=1.66$, $p>0.05$). Given that both gender groups were almost equally represented, gender bias was unlikely to have influenced these results.

The responses received from non co-op graduates were principally from those who had a high academic performance index in both second and final years of university. An analysis of final year academic results for non co-op graduates with low academic results in second year of university could therefore not be undertaken.

A third possible explanation for differences in university academic results between co-op graduates and non co-op graduates may be the differences between the university entrance standards that each cohort had to meet. To explore this possibility, the data on university entry scores and academic results in Attachment

11 and summarized in Table 12 were considered taking into account only those responses from graduates with comparable university entrance scores.[7]

Table 12: University Entry Scores and Academic Results for Co-op and Non Co-op Graduates

	No	**Mean university entry score**	**The mean API & SD for second year university academic results**	**The mean API & SD for final year university academic results**	**t-test for paired sample means**	**Pearson's correlation coefficient**
Co-op graduates	26	84.71	14.4 (5.81)	18.8 (5.01)	t=3.33 (p=0.0013)	r=0.25 (t=1.25) (p>0.01)
Non co-op graduates	20	82.63	18.1 (4.74)	20.4 (5.91)	t=2.04 (p=0.0275)	r=0.58 (t=2.98) p<0.01)

The university entrance scores in Victoria are called Tertiary Entrance Requirements (TER), and are used to rank all students completing the final year of secondary school. From the results in Table 12, it can be seen that students entered the Economics and Finance program with its compulsory co-op program with a slightly higher entry level score (but not significantly different) than students who entered other finance related programs that did not include a co-op component. The average academic performance index for non co-op graduates when they were in second year was significantly higher than for co-op graduates when they were in second year (t=2.3287, p=0.0245, Attachment 11-2). There were, however, no significant differences in final year university results between co-op graduates and non co-op graduates (t=0.99, p=0.3267, Attachment 11-2).

[7] Essentially this meant that only graduates who commenced their undergraduate university studies between 1995 and 1997 were considered.

Given that means can be influenced by extreme values, the above results were confirmed by examining the difference in academic performance between co-op graduates and non co-op graduates using medians instead of means (Attachment 11-3).[8]

The difference between the cohorts in the second year results, given that there were no significant differences in the university entry standards, may have been due to the differences in either the university experiences or the marking standards.[9] If the assumption is made that any differences between universities, be they in experiences or marking standards, did not change from the second to the final years, then the improvement in academic results due to the co-op experience remains a valid explanation.

3.7 Summary of Learning Outcomes for Co-op Students and Graduates.

There is evidence to suggest that the co-op experience had a significant impact on students' approaches to learning and on their academic results. To summarize:

- There was a significant reduction in the likelihood of co-op students adopting a RO to learning when compared to those students undertaking on-campus study.

- The impact of co-op on the likelihood of adopting a MO both during co-op and on return to on-campus studies was much lower than expected. This may have been

[8] The differences between the median and the means were so small that further testing was unnecessary.
[9] It is however recognized that while these are possible explanations, the reasons for the differences in second year results given that university entry standards are not significantly different, need to be further investigated.

the result of a lack of consistency between the actual management of co-op programs and the conditions necessary for deep level learning to take place. Alternatively, the Approaches to Study Inventory was not designed to measure approaches to workplace learning and may need to be re-considered in this light.

- Co-op had a significant impact on the academic performance of students after their return to on-campus study. The improvement in final year results compared to those in second year was far greater for students who had undertaken co-op than for those who had not. These results were even more powerful given that university entrance scores for co-op graduates and non co-op graduates were not significantly different and that the discipline studied by each cohort was very similar. Furthermore, the results indicated that female students were the most likely to benefit from the co-op experience.

- Co-op was also an important factor in explaining the improvement in academic results for students with low academic performance in their second year. After returning to on-campus studies having completed co-op, the results for this cohort of students increased to almost a distinction average from a pass average in second year.

The focus of this study has been on Finance, Banking and Commerce students. In order to test whether these results can be generalized, studies examining the influence of co-op in other disciplines will need to be undertaken. Furthermore, the number of graduates in each cohort was limited by the size of the RMIT program and the low response rate from the non co-op graduates. Those who did respond, generally had

high academic performance and hence it is possible that the results were subject to a response bias. This, however, strengthens any results that demonstrate better academic outcomes for co-op graduates compared to non co-op graduates. A critical factor in being able to demonstrate this impact of co-op on academic performance was to find a way of controlling for other influencing variables. In this study, the control was achieved by locating two cohorts of students with similar university entrance standards, who were undertaking similar courses with one student cohort being required to complete a compulsory co-op program while the other did not have a co-op option. Being able to meet these conditions has meant that some of the methodological problems experienced by others (McDowell & Comerford, 1996; Gerrand, 1995; Van Gyn et al. 1996 & 1997) have been overcome. The same controls were also important when the employment outcomes for co-op graduates were compared to those for non co-op graduates.

Chapter 4

EMPLOYMENT OUTCOMES OF COOPERATIVE EDUCATION

4.0 Chapter 4 Summary.

This chapter compares the employment outcomes for co-op graduates to those experienced by non co-op graduates. The employment outcomes are defined in terms of the graduate employment rate, job search time, salaries, career knowledge, job turnover rates, level of job and pay satisfaction. The literature relating to each of these areas is reviewed in the light of the results obtained in this current study and methodological issues are discussed.

4.1 The Employment Benefits to Co-op Graduates.

Studies comparing the employment outcomes for co-op graduates and non co-op graduates undertaken in Australia (Clarke & Zuhair, 1995) and Canada (Van Gyn & Ricks, 1997) found that co-op graduates have a higher rate of full-time graduate employment and are more likely to be employed in a field related to their studies. The Canadian study (Van Gyn & Ricks, 1997) also found that co-op graduates earn significantly higher salaries than non co-op graduates. There are, however, other employment outcomes that have been examined including the job search time, career knowledge, job satisfaction and turnover rates (Clarke & Zuhair, 1995; Dubick, McNerney & Potts, 1996; Gardener & Motschenbacher, 1997; Gardener, Nixon & Motschenbacher, 1992; Kysor & Pierce, 2000; Rowe, 1992; Van Gyn & Ricks, 1997; Wessels & Pumphery, 1995, 1996).

The results of all these studies (summarized in Attachment 1) were grouped into the following categories, each measuring an aspect of the graduate employment outcomes:

- Employment rate
- Job Search Time (JST)
- Salaries
- Career knowledge, job and salary satisfaction and turnover rates

This facilitated an analysis of previous comparisons that have been made between co-op graduates and non co-op graduates for each employment outcome category, and of any methodological problems that still needed to be addressed.

4.1.1 Employment rate.

Some evidence suggested that there is a higher percentage of co-op graduates finding graduate employment within six months after completing their studies, compared with non co-op graduates (Clarke & Zuhair, 1995; Rowe, 1992; Van Gyn & Ricks, 1997). This increased employment rate could have arisen because co-op graduates were more committed to seeking employment than non co-op graduates (Rowe, 1992). These results, however, could also have been confounded by the lack of distinction made between those co-op graduates who stayed on with their co-op employers after graduation and those who sought new employment.

Some studies found that between 25% and 33% of co-op graduates stayed on with their co-op employer (Clarke & Zuhair, 1995; Gardener & Motschenbacher,

1997; Gardener, Nixon & Motschenbacher, 1992). Others found this figure to be as high as 40% (Wessels & Pumphrey, 1995) or over 50% (Dubick, McNerney & Potts, 1996). For the remaining co-op graduates who were seeking new jobs, there was no significant difference in the employment rate of co-op graduates compared to non co-op graduates (Dubick, McNerney & Potts, 1996) and co-op was found to have little effect on the job search time of graduates (Wessels & Pumphrey 1995).

4.1.2 Job Search Time.

As with other employment outcome variables, the findings related to job search time are contradictory. Some (Clarke & Zuhair, 1995) found evidence to support a shorter job search time for co-op graduates compared to non co-op graduates, with co-op graduates taking just over a month and non co-op graduates taking close to three months to find full-time employment (Dubick, McNerney & Potts, 1996). Others found no significant difference in job search time for co-op graduates compared to non co-op graduates, with the average time varying from three-and-a-half months (Kysor & Pierce, 2000) to six-and-a-half months (Wessels & Pumphery, 1995).

The lack of statistical significance in these results could be explained if co-op graduates seeking new jobs were very specific about the type of employment that they would accept. This could have resulted in their job search time being statistically no different to that of the non co-op graduates who may have found it difficult to get any job. Alternatively, the results relating to job search time could

be influenced by varying labor market conditions, as discussed in Chapter 1, or by the different discipline areas of the graduates.

This study has therefore compared the job search time for co-op graduates and non co-op graduates who were matched for variables that may otherwise confound the results such as age, discipline area of study and labor market conditions.

4.1.3 Salaries.

The research findings relating to salary differences between co-op graduates and non co-op graduates are also very disparate. Some (Clark and Zuhair, 1995; Kysor & Pierce, 2000) found no significant difference in starting salaries for the two graduate cohorts while others (Dubick, McNerney & Potts, 1996; Gardener, Nixon & Motschenbacher, 1992; Van Gyn & Ricks, 1997) found that these salary differences were significant and that co-op was a key variable determining salaries. These differences, however, were also found to disappear over time (Gardener & Motschenbacher, 1997; Wessels & Pumphery, 1996).

Somers (1995) in his literature review on studies related to the pecuniary benefits of co-op graduates compared to non co-op graduates, found that the results from studies without statistical controls were not only mixed but unreliable. The reviewed studies that indicated that co-op graduates earned more than non co-op graduates did not account for the differences in academic grades. Where these academic differences occur, it could be argued that high academically achieving students are those who choose co-op. It would therefore be unclear whether the higher grades or co-op have led to higher earnings after graduation. The

explanation for the wage differentials would also be confounded if a biased sample design were used. This could well have been the case if the sample of co-op graduates had been taken from a different discipline area or from a different market location to that of the non co-op graduates.

> In studies that have controlled for some sampling bias and in those that have used univariate statistical testing such as chi-squared tests of differences, some significant salary differences have been found … (Somers, 1995, p. 29).

These studies, however, did not consider the impact that the amount of DRWE would have had on salaries. When starting salaries for co-op graduates and non co-op graduates have been compared, the co-op graduates have generally had at least a year more DRWE than the non co-op graduates. When Rowe (1992) controlled for the academic standard of graduates and matched the co-op graduates and non co-op graduates by their year of university entry so that both cohorts had experienced the same amount of DRWE, she found that there was no significant difference between their median salaries. She concluded that '…a year spent as a permanent employee after graduation is at least as valuable as the time spent as a co-op student' (Rowe, 1992, p. 14).

This evidence suggests that some employers did not distinguish between co-op and other DRWE. Not all employers regarded the various types of DRWE to be the same and it has been found that some employers distinguish between DRWE obtained during summer placements and post graduation DRWE. Gardener and Motschenbacher (1997) found that the starting salaries of co-op

graduates were significantly higher than the starting salaries of graduates who had undertaken DRWE during summer placements, although these differences disappeared over time. This salary differential may well have reflected the belief that some employers had, that co-op students out-performed summer placement students (Young, 1997), although performance differentials based on undergraduate work experiences became smaller as the amount of post graduation work experience increased.

Another area that was examined is whether employers make a distinction between DRWE and non-DRWE and whether this distinction is reflected in salary differentials. One study (Dubick, McNerney & Potts, 1996) that incorporated a part-time work variable in a regression analysis found that it was not a significant variable in explaining variations in graduate starting salaries with the implication that employers did not reward graduates with higher salaries for undergraduate non-DRWE obtained.

4.1.4 Career knowledge, job satisfaction and turnover rates

Other benefits of co-op to both graduates and employers have been associated with job quality leading to greater levels of satisfaction for the employees and productivity gains for the employers. Job quality has been measured by low job turnover and it has been argued that high job turnover has high associated economic costs (Wessels & Pumphrey, 1995). It has further been argued that co-op graduates have a better understanding of the job market and career expectations (Sharma, Mannell & Rowe, 1995) and therefore choose their jobs more carefully. It would therefore follow that co-op graduates would be more

satisfied with their jobs and would have a lower job turnover rate than non co-op graduates.

The evidence related to the impact that co-op has on career knowledge, job satisfaction and turnover rates, is once again contradictory. Van Gyn and Ricks (1997) found that the job satisfaction ratings of co-op graduates were significantly higher than the ratings given by the non co-op graduates. In contrast, Rowe (1992) found that there was no significant difference in the job satisfaction levels of co-op graduates compared to non co-op graduates and that level of satisfaction with pay was also the same for the two graduate cohorts even though co-op graduates earned more than non co-op graduates. Kysor and Pierce (2000) also found that co-op had no significant impact on satisfaction levels except when co-op graduates were compared to graduates with no previous work experience at all.

Given that the supporting evidence, that co-op graduates were more satisfied with their job and their pay than non co-op graduates, is contradictory, it also follows that the link between higher levels of job satisfaction and lower job turnover rates for co-op graduates, may not be there. While little research into this area has been undertaken, Wessels and Pumphery (1995) found that co-op had only a slight effect on turnover rate unless the graduate returned to his/her co-op employer, when the probability of changing jobs was reduced from 53.1% to 42.7%[1].

[1] These results have been discussed in more detail in chapter 5 together with their implications for employers who have generally aimed to reduce their graduate recruitment costs by decreasing the job turnover rates for graduates.

4.2 Addressing the Issue of Employment Outcomes.

In order to explore employment outcomes of co-op programs, the following question was addressed.

> Are there any differences in employment outcomes – measured in terms of employment rates, job search time, salaries earned, career knowledge, job and salary satisfaction and turnover rates – for co-op compared to non co-op graduates when both cohorts have accrued the same time in DRWE?

These graduate employment outcomes were examined in the Australian context and efforts were made to control the confounding variables discussed previously (pp. 31-32), i.e. the graduates were matched by university entry standards and age, and academic performance throughout their studies was taken into account. All graduates completed the same discipline area of study and worked under the same labor market conditions. The number of years of DRWE at the time of study, both for co-op graduates and non co-op graduates, was designed to be the same and any variations in types of work experiences were analyzed for their effect on graduate employment outcomes.

4.3 Method of Data Collection for Employment Outcomes.

The questionnaire used to gather information on graduate employment outcomes (Attachment 2-3) was based on those developed for other studies (Braunstein, 1999; Clarke & Zuhair, 1995; Young, 1997) and covered similar areas. A focus group of non co-op graduates was also held to gain a better understanding of the factors that influenced their choices relating to the universities that they attended and the places of graduate employment (See Attachment 2-4).

The results of 30 out of the 32 co-op graduates were analyzed for employment outcomes as one graduate had gone on to full-time post-graduate studies and one graduate had traveled overseas. Neither graduate therefore, had any post degree work history.

In relation to the non co-op graduates with no undergraduate DRWE, the 24 whose results had been included in Table 9 were also included in the analysis of employment outcomes. Two more non co-op graduates with no undergraduate DRWE, who had previously been excluded as they had not recorded their academic results, were included in the analysis of employment outcomes.

4.4 Results and Discussion.

All data relating to employment outcomes for co-op graduates and non co-op graduates are presented in Attachments 5-2 & 6-2. It was found that some non co-op graduates had additional DRWE that they had obtained either through summer placements or through part-time work while they were undergraduate students. Employment outcomes for this group were separated from the outcomes for those non co-op graduates who had only obtained their DRWE after graduation. This enabled the impact of different forms of undergraduate work experience on graduate employment outcomes to be explored.

A profile of the respondents is given in Table 13.

Table 13: A Profile of the Respondents.

	Co-op graduates	**Non co-op graduates with no undergraduate (UG) DRWE**	**Non co-op graduates with UG DRWE**
Females (number)	16	11	9
Males (number)	14	15	4
Mean Age (years) (Standard Deviation)	24.5 (2.6)	24.2 (1.6)	24.8 (1.4)
Mean final year API (Standard Deviation)	17.2 (5.5)	20.2 (5.8)	20.6 (7.0)

The results in Table 13 confirm that there were no significant differences between the average ages of the graduate cohorts (t=0.62, p=0.54; t=0.04,p=0.97; t=-0.72, p=0.48; Attachment 8-2). In contrast to other studies that have compared co-op and non co-op employment outcomes (Rowe, 1992; Van Gyn & Ricks, 1997), the non co-op graduates in this study had, on average, higher final year academic results when compared to the co-op graduates (t=1.76, p=0.04; t=2.13, p=0.02; Attachment 8-8). A plausible explanation for this is that over 90% of co-op graduates, with varying academic results, responded, while the response rate from non co-op graduates was very low and generally, only those with high academic performance responded. This means that any advantage in employment outcomes that may be found to exist for co-op graduates compared to non co-op graduates, would not be due to the higher academic performance of co-op graduates.

The analysis of the employment outcomes for co-op graduates and non co-op graduates was consequently undertaken and the discussion of results has been divided into the four main outcome areas that have previously been identified.

4.4.1 Employment rate.

The data related to employment experiences for co-op graduates and non co-op graduates are presented in Table 14.

Table 14: Employment Rate of Co-op Graduates Compared to Non Co-op Graduates by Time Taken to Find Employment.

	Percentage of graduates employed within each time period							
	No time	**<1mth**	**1-2mths**	**3-4mths**	**5-6mths**	**7-12mths**	**>1yr**	**Total Number of grads**
Co-op graduates	64%	27%	3%	3%	3%			30
Non co-op graduates with DRWE	23%	31%	38%	8%				13
Non co-op graduates with no UG DRWE	15%	4%	31%	23%	11.5%	11.5%	4%	26

The results in Table 14 show that 100% of co-op graduates found graduate employment within six months of completing their studies while over 90% had found employment within a month. This compares to approximately 85% of non co-op graduates with no previous DRWE who found work within six months and only 19% who found work within one month of actively seeking employment. Non co-op graduates with undergraduate DRWE had a higher employability rate

than other non co-op graduates with over 50% finding full-time employment within the first month of actively seeking employment. This rate was still substantially lower than the comparable figure for co-op graduates.

The results of this current study are consistent with the similar comparisons made in Canadian studies (Rowe, 1992; Van Gyn & Ricks, 1997) and a recent British study (Bowes & Harvey, 2000). A US study (Dubick, McNerney & Potts, 1996), however, found no significant differences in employment status between co-op graduates and non co-op graduates. One explanation for the disparity in these results rests again in the different labor market conditions that may have influenced the employment rates of graduates. The results in Table 14 were therefore compared to those obtained in a similar Australian study (Clarke & Zuhair, 1995). The results in both studies are consistent. The earlier study (Clarke & Zuhair, 1995), however, was undertaken during a time of economic downturn and therefore the support for a higher employability rate of co-op graduates compared to non co-op graduates was not as strong as in the current study. Despite the high unemployment rate in the state of Victoria, Clarke and Zuhair (1995) still found that co-op graduates had an employability advantage with only 14.5% of co-op graduates unemployed compared to 43.8% of the non co-op graduates.

There was no unemployment among graduates in the current study, however, this was not necessarily an accurate reflection of the employment market in Victoria. The employability rate of co-op graduates was accurate for this group at the time of the study since access was gained to every member of the targeted population.

Access was not, however, gained to all the non co-op graduates. The response rate from non co-op graduates was very low and it is possible that only the graduates who were in full-time employment responded to the questionnaire. Furthermore, the total sample size of the group of non co-op graduates with undergraduate DRWE was only 13 and therefore limits any conclusions that could be drawn from the data. Even if the results analyzed were confined to those for the two other graduate cohorts, there was still supporting evidence that co-op graduates had a higher employability rate compared to non co-op graduates. The employability rate was also related to the time that it took a graduate to find employment. This was defined as the job search time.

4.4.2 Job search time.

The average time for each graduate cohort, to find full-time discipline-related graduate employment, is summarized (from Attachment 12-2) in Table 15.

Table 15: Average Time Taken to Find Full-time Graduate Employment

	Co-op graduates	**Non co-op graduates with UG DRWE**	**Non co-op graduates with no UG DRWE**
Average time	0.4 months	1.2 months	3.42 months[2]
Standard deviation	1.0 month	1.2 months	3.36 months

There is a significant difference between the average search times given in Table 15 ($F=12.87$, $p=0.00002$; Attachment 12-2) and it can be seen that non co-op graduates with no DRWE took on average, eight times as long as co-op graduates

to find full-time, discipline-related employment. The average job search time for a co-op graduate, of around two weeks, was significantly shorter than the average job search time for a non co-op graduate with no undergraduate DRWE, of almost three-and-a-half months (t=-4.3, p=0.0001; Attachment 12-2). These results are consistent with those found by Dubick, McNerney & Potts (1996).

One of the reasons that the job search time for co-op graduates was significantly shorter than for non co-op graduates is that co-op graduates have stayed on with their co-op employer after graduation and therefore had effectively no job search time. This explanation is supported by the statistics gathered from co-op graduates (Attachment 5-2) that showed that 57% of co-op graduates returned to their co-op employer after completing their studies[3]. This result was consistent with, although generally higher than, the findings of other similar studies (Clarke & Zuhair, 1995; Dubick, McNerney & Potts, 1996; Gardener & Motschenbacher, 1997; Gardener, Nixon & Motschenbacher, 1992; Wessels & Pumphery, 1996).

4.4.3 Salaries.

Some studies have shown than co-op graduates earn more than non co-op graduates (Dubick, McNerney & Potts, 1996; Gardener, Nixon & Motschenbacher, 1992; Van Gyn & Ricks, 1997). It was argued (Rowe, 1992) that these higher salaries may reflect the greater DRWE or the higher academic grades of the co-op graduates compared to the non co-op graduates. When Rowe

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[2] A non co-op graduate who took two years to find employment was removed to gain this average. With this outlier included, the average search time for non co-ops with no DRWE is 4.2 months with a standard deviation of 5.2 months.

[3] Details are provided in Table 31, p. 123.

(1992) controlled for both of these factors she found that there was no significant difference in median salaries of co-op graduates compared to non co-op graduates.

The intended design of this current study was constructed so that all graduates would have similar levels of DRWE and academic standards. There was, however a bias in the non co-op graduate respondents. Generally, only the non co-op graduates with high academic results responded to the questionnaire (Table 13, p. 83). If academic grades are rewarded with higher salaries, any positive effects of co-op on salary levels would therefore be harder to identify.

Gardener, Nixon and Motschenbacher (1992) had developed a regression model that explained the variation in graduate starting salaries in terms of the variation in co-op, academic grades, personal characteristics (such as age, gender and race), and labor market conditions. In this current study, personal characteristics and labor market conditions were controlled and hence only limited regression analysis was undertaken with co-op, final year academic grades, gender and the length of time of DRWE considered as possible explanatory variables for graduate salary differences. While this regression model did not explain starting salaries (Attachment 14-2), it was found (Attachment 14-3) that this regression model accounted for the variability in current salaries ($F=2.85$, $p=0.03$). The significant variables were final year academic grades ($b=0.43$, $t=2.04$, $p=0.045$) and DRWE ($b=3.45$, $t=2.72$, $p=0.008$). It was also found that the non co-op graduates with DRWE had significantly higher DRWE ($t=3.14$, $p=0.004$, Attachment 12-3) and significantly higher final year results ($t=2.13$, $p=0.02$, Attachment 8-8) than co-op graduates. While non co-op graduates with no DRWE had significantly lower

DRWE than co-op graduates (t=-4.72, p=0.00001, Attachment 12-3) they had significantly higher final year results than co-op graduates (t=1.76, p=0.042, Attachment 8-8). It would therefore generally be expected that the current salaries of non co-op graduates would be higher than the current salaries of co-op graduates.

In line with other studies (Gardener & Motschenbacher, 1997; Somers, 1995) the impact of various types of undergraduate work experience (for example summer placement or non-DRWE) on graduate salaries was considered in this current study. Tests for differences of means were used to identify what differences existed in salaries between co-op graduates and non co-op graduates.

Using the data in Attachments 12-3 to 12-5, Table 16 summarizes the starting salaries, the current salaries and the length of time in the workforce for both co-op graduates and non co-op graduates.

Using the data in Table 16, tests for differences of means for independent samples were undertaken (Attachment 12-6). There was no significant difference between the average starting salary of non co-op graduates with three years of academic history and the average salary for co-op students with two years of academic history and one year of discipline-related work experience (t=0.14, p=0.8880; t=-0.39, p=0.6972). This is of special interest given that the co-op students had not yet graduated at this time and their academic profile of their first two years at university was, on average, lower than that of the non co-op graduates (Table 8, p. 63). This suggests that there was some added value in the co-op experience but

did this value translate into measurable salary differences after the co-op students had graduated and if so, for how long were these differences sustained?

Table 16: The Salary Differences Between Co-op and Non Co-op Graduates

	Co-op starting salary. Ave (SD)	**Salary one year post co-op Ave (SD)**	**Graduate start salary Ave (SD)**	**Current salary Ave (SD)**	**Length of time in the work force (Years)**
Co-op graduates*	$25,191 ($2,831)	$30,965 ($4,375)	$37,317 ($ 5,904)	$42,580 ($ 8,945)	Ave = 2.67 SD = 0.54
Non co-op graduates with UG DRWE			$31,392 ($ 2,044)	$47,453 ($ 9,016)	Ave = 4.23 SD = 1.75
Non co-op graduates with no UG DRWE			$30,776 ($ 4,908)	$43,224 ($12,058)	Ave = 1.77 SD = 0.83

* Not all salaries are as of Feb. 2001. Four salaries are as of Oct/Nov 2000 as the graduates have since moved on. Two have gone overseas, one has taken up full-time study and one has gone into his father's business without taking a specified salary.

There was a significant difference between the average starting salary for co-op graduates compared to non co-op graduates who had no undergraduate DRWE ($t=4.49$, $p=0.00001$, Attachment 12-6). This result is consistent with other studies (Dubick, McNerney & Potts 1996; Gardener, Nixon & Motschenbacher, 1992; Van Gyn & Ricks, 1997) but it has been argued that this significant difference in starting salaries merely reflects the difference in the DRWE of the two cohorts (Rowe, 1992). If this is the case, then the graduate starting salary of co-op graduates would be expected to be the same as the starting salary for non co-op graduates with previous DRWE.

Gardener and Motschenbacher (1997) found this to be the case and their results showed no differences in graduate starting salaries between co-op graduates and graduates who had undertaken either discipline-related undergraduate part-time work or summer placements. Their research also showed that these salaries were higher than those for graduates with no previous work experience at all. This would suggest that graduate starting salaries reflected the level of undergraduate DRWE of the graduate.

While this current study was designed to apply to graduates with a total of two years full-time DRWE, it was found that this was not the case. From the data in Table 16, it can be seen that co-op graduates had on average, about two-and-a-half years of DRWE; one year post graduation and one-and-a-half years prior to degree completion. The half-year represents the part-time discipline-related work that co-op students tended to continue with, even after they returned to on-campus study to complete their degree. The non co-op graduates with no undergraduate DRWE had on average, 1.8 years of work experience. The shortfall from the expected two years can be explained by the two to three months that it took on average for non co-op graduates to find graduate employment. The non co-op graduates who did have undergraduate DRWE, had on average been in the workforce for the equivalent of two years prior to study completion and two years post graduation. It was therefore expected that these non co-op graduates with two years of undergraduate DRWE would have a higher graduate starting salary (or at least the same salary) as the co-op graduates with one-and-a-half years of undergraduate DRWE. This, however, was not the case.

The average starting salary of co-op graduates of $37,317 (Table 16) was significantly higher than the average starting salary of $31,392 (Table 16) of non co-op graduates with undergraduate DRWE (t=4.82, p=0.0001, Attachment 12-6). Furthermore, there was no significant difference in average starting salaries of non co-op graduates with undergraduate DRWE compared to non co-op graduates without this experience (t=0.54, p=0.5940, Attachment 12-6). Summer placements or part-time discipline-related work experience, therefore, did not seem to have an impact on average starting salary levels for non co-op graduates.

To determine the impact on salaries of post co-op undergraduate DRWE, the starting salaries of co-op graduates who had continued in discipline-related work post co-op were compared to the starting salaries of co-op graduates who had returned to full-time study without taking on any discipline-related work experience (Table 17 below).

Table 17: Salary Differences Within the Co-op Cohort

	Graduate starting salary Average (SD)
Graduates who as students, returned to DRWE after co-op.	$37,609 ($6,399)
Graduates who as students, did not return to DRWE after co-op	$36,357 ($4,110)

There was no significant difference between the average starting salary offered to co-op graduates who have additional DRWE and the average salary offered to co-

op graduates who did not have this experience (t=0.611, p=0.5497, Attachment 12-7).

This suggests that employers did not reward the post co-op work experience with higher graduate salaries.

One conclusion that could be drawn from these results is that while the co-op year was recognized by employers through higher average graduate starting salaries, this was not the case for other types of work experiences, including summer placements, traineeships or even post co-op undergraduate DRWE. There was no significant difference between graduate starting salaries of co-op graduates whether or not they had, as students, continued with discipline-related work post co-op. Furthermore, no significant difference was found between graduate starting salaries of non co-op graduates whether or not they had undergraduate DRWE.

These results could be explained if those without the summer placements, traineeships or even post co-op undergraduate DRWE still had part-time jobs and graduate employers did not distinguish between discipline-related and non discipline-related work experiences outside of the co-op year.

It was indeed the case that 80% of the non co-op graduates without undergraduate DRWE had other work experience prior to graduation (Attachment 6-2). The co-op group who did not return to discipline-related work post co-op, was a very small one although two out of the seven took up part-time non discipline-related work after co-op (Attachment 5-2).

Furthermore, research undertaken on behalf of the Australian Government (Barnes et al. 1999) supported previous findings (Huggett & Skringar, 1997; Lelliott, 1995) that employment of graduates was based on their generic skills level rather on their technical abilities. There was also the view that these generic skills could be developed through the work environment, whether or not this environment was discipline-related (Karpin, 1995).

This suggests that work experiences outside of co-op, whether they were discipline-related or not, were regarded by employers as equally valuable and therefore they did not distinguish between them in setting graduate starting salaries. There was, however, supporting evidence for the premise that co-op resulted in increased average graduate starting salaries. This raised the question of over which time period this benefit persisted?

An analysis was undertaken of the average starting salary for co-op graduates compared to the average starting salary for non co-op graduates when all graduates had three academic years and one year of employer recognized discipline-related work. The employer recognized discipline-related work was either the one year of co-op (for the co-op graduates) or the one year of discipline-related work after degree completion (for the non co-op graduates). A summary of results is contained in Table 18.

Table 18: Salaries for Graduates with Three Academic Years and One Industry Year.

	Graduate salaries at 3 years

	academic & 1 year industry experience. **Average** **(SD)**
Co-op graduates	$37,317 ($ 5,904)
Non co-op graduates with no UG DRWE	$38,900 ($11,300)

These results show that the variability in non co-op salaries after one year in the work force, was significantly greater than the variability in average graduate starting salaries for co-op graduates (F=3.66, p=0.0046; Attachment 12-8). This variation may reflect the differences in progression after one year, the type of companies and the type of work that non co-op graduates compared to co-op graduates might find themselves in after one year of recognized industry experience.

When the average salaries presented in Table 18 were compared, there was no significant difference between the salaries of co-op graduates and non co-op graduates when each group had the experience of three academic years and one industry year (t=-0.4041, p=0.3478, Attachment 12-8). This could lead to the conclusion that the market did not distinguish between the co-op year experience and one year of post graduation DRWE. This conclusion, however, should be tempered by the fact that the sample-size for the non co-op graduates with only one-year of industry experience was only nine. Furthermore, an analysis of current salaries provided an alternative interpretation of these results.

In analyzing the current salaries for co-op graduates and non co-op graduates (Table 16), there were no significant differences between any of the average salaries

(t=-0.22, p=0.8247; t=-1.58, p=0.1303; Attachment 12-6). This could mean that any advantage that co-op graduates had in terms of higher graduate salaries, compared to non co-op graduates, disappeared within two years of the non co-op graduate commencing discipline-related work. It was, however, shown that current salaries varied with DRWE and final year results, and that all the non cop graduates had significantly higher final year results than the co-op graduates and that non co-op graduates with undergraduate DRWE had significantly more DRWE than co-op graduates (p. 88). Given that the average current salaries of co-op graduates and non co-op graduates were not significantly different, it could be argued that the employers paid the same salary for the added value of the co-op experience as they did for higher final year results and more DRWE.

In summary, the evidence supports the proposition that employers recognize the benefit of a co-op year over and above that which can be gained from summer placements, traineeships and post co-op discipline related work. One explanation for this is that the co-op program is formalised to integrate the work and academic experiences and both the university and the co-op employer support student learning.

It also appeared that employers rewarded undergraduate work experience whether or not it was discipline-related. This could be explained by the value that employers place in the development of generic skills in graduates with the belief

that any work experience, whether discipline-related or not, would help to foster these skills.

Finally, while the average graduate starting salary for co-op graduates was higher than that for non co-op graduates, if the additional year of work experience that co-op graduates had was accounted for, then this salary differential disappeared. An explanation for this lack of difference between salaries for co-op graduates and non co-op graduates is that employers, in paying salaries, did not differentiate between the co-op experience of the co-op graduates and the higher final year results of the non co-op graduates.

4.4.4 Job turnover, the level of career knowledge, job and salary satisfaction.

There are several other positive employment outcomes that have been associated with co-op, for example lower job turnover rates for co-op graduates (Clark & Zuhair, 1995; Wessels and Pumphery, 1995). It was argued that the lower turnover reflected the higher level of job and salary satisfaction and better career knowledge of co-op graduates compared to non co-op graduates. Wessels and Pumphery (1995), however, found that any differences between co-op graduates and non co-op graduates in their job turnover rate occurred only when co-op graduates returned to their co-op employer after graduation.

Table 19: Job Turnover Rates

	Length of time working, post graduation, with a single, discipline-related company. (Years)	**Total length of time in discipline-related work. (Years)**
Co-op graduates	Ave=2.07 SD=0.93 n=30	Ave = 2.67 SD = 0.5
Non co-op graduates with UG DRWE	Ave=2.85 SD=2.22 n=12	Ave = 4.23 SD =1.75
Non co-op graduates with no UG DRWE	Unable to track	Ave = 1.77 SD = 0.83

From Table 19 above, it can be seen that both co-op graduates and non co-op graduates with undergraduate DRWE stayed with one company for an average of approximately two years. Co-op graduates only had two-and-a-half years of work experience while the non co-op graduates had more than four years. This suggests a lower job turnover rate for co-op graduates although sample sizes need to be larger and more data covering a longer time period need to be collected to test this further. There are, however, other variables associated with job turnover that could be considered. Low job turnover rates have been associated with high levels of job and salary satisfaction (Wessels & Pumphrey, 1995) as well as with a good level of career knowledge (Sharma, Mannell & Rowe, 1995).

Comparisons were made between the levels of job and salary satisfaction for co-op graduates and non co-op graduates (Tables 20 and 21). The results indicated that a similar percentage of co-op graduates compared to non co-op graduates

were satisfied with their current job and salary, however there was a disparity in the dissatisfaction levels. A greater percentage of non co-op graduates compared to co-op graduates, were dissatisfied with either their job or their current salary level, which is consistent with the tendency for higher job turnover rates of non co-op graduates compared to co-op graduates. A chi-squared test should have been undertaken to determine whether or not job and pay satisfaction levels are independent of co-op, however, the number of observations in some of the expected cells was lower than five thereby breaching one of the necessary conditions for conducting the test.

Table 20: Frequency Distribution of Job Satisfaction.

Job Satisfaction*	Co-op graduates	Non co-op graduates with UG DRWE	Non co-op graduates with no UG DRWE
Dissatisfied	10%	8%	27%
Neutral	37%	17%	31%
Satisfied	53%	75%	42%
Total	30	12	26

* A 5-point scale was used with 1 = very dissatisfied and 5 = very satisfied. Categories 1 & 2 were collapsed to get a percentage of graduates dissatisfied while categories 4 & 5 were collapsed to get a percentage of graduates satisfied.

Table 21: Frequency Distribution of Salary Satisfaction.

Salary Satisfaction*	Co-op graduates	Non co-op graduates with UG DRWE	Non co-op graduates with no UG DRWE
Dissatisfied	10%	25%	42%
Neutral	43%	8%	12%
Satisfied	47%	67%	46%
Total	30	12	26

* A 5-point scale was used with 1 = very dissatisfied and 5 = very satisfied. Categories 1 & 2 were collapsed to get a percentage of graduates dissatisfied while categories 4 & 5 were collapsed to get a percentage of graduates satisfied.

Since a Likert scale was used to measure satisfaction levels, it is also possible to calculate the average satisfaction levels for each group of graduates and to subject the data to an analysis of variance (see Attachment 12-9). A summary of these results is given in Tables 22 & 23.

Table 22: Analysis of Variance in Job and Salary Satisfaction Levels.

	Job Satisfaction	**Salary Satisfaction**
F-value	87.94	67.11
P-value	2.25E-16	1.8E-13

Table 23: Average Job and Salary Satisfaction Levels.

	Job Satisfaction	**Salary Satisfaction**
Co-op graduates	Ave = 3.60 SD = 0.17 n=30	Ave = 3.48 SD = 0.15 n=30
Non co-op graduates with UG DRWE	Ave = 3.96 SD = 0.26 n=12	Ave = 3.63 SD = 0.32 n=12
Non co-op graduates with no UG DRWE	Ave = 3.23 SD = 0.23 n=26	Ave = 3.06 SD = 0.25 n=26

From Tables 22, the variation in satisfaction levels between the various groups of graduates is confirmed. While the higher satisfaction levels for co-op graduates compared to non co-op graduates with no undergraduate DRWE is an expected

result, the higher levels of satisfaction for non co-op graduates with undergraduate DRWE compared to co-op graduates is contrary to expectations (Table 23). It is again noted that there are only 12 non co-op graduates with undergraduate DRWE and a larger sample size would need to be taken to confirm the above results. It would also have been useful to conduct interviews with all the graduates in order to gain a better understanding of what factors influence their job and salary satisfaction levels. Of particular interest is whether or not there is an influence of undergraduate work experience on graduate job and salary satisfaction levels.

If graduates have a good level of career knowledge, it is also likely that they would be more able to choose the jobs that they thought would suit them (Sharma, Mannell & Rowe, 1995) and hence would have high levels of job satisfaction and low job turnover rates. Given that there was some evidence that co-op graduates had a lower job turnover rate than non co-op graduates, they would also be expected to have better career knowledge than non co-op graduates. The data in Table 24 are not consistent with this contention and it seems that only about a third of the co-op graduates, as opposed to over half of the non co-op graduates, believed that they had good career knowledge. A chi-squared test of independence again could not be performed, as the necessary expected cell size was not achieved. An additional problem with these data is that the information gathered was based on the self-reporting of the graduates which may not be an accurate reflection of their knowledge of the market, the jobs available, skills required and career path options. A method of verifying whether or not this was the case would be to measure the level of career knowledge using an objective test developed for this purpose.

Table 24: Frequency Distribution of Career Knowledge.

Career Knowledge*	Co-op graduates	Non co-op graduates with UG DRWE	Non co-op graduates with no UG DRWE
Little career knowledge	7%	8%	15%
Neutral	56%	42%	27%
Good career knowledge	37%	50%	58%
Total	30	12	26

*Career knowledge was measured on a 5-point scale with 1 = no career knowledge and
5 = perfect career knowledge. Categories 1 & 2 were collapsed and taken to mean little career knowledge while categories 4 & 5 were collapsed to mean good career knowledge.

4.5 Summary of Employment Outcomes for Co-op Graduates.

Some methodological problems of past studies have been overcome in this current study by controlling for academic entry standards, age, discipline area of study and labor market conditions. There was a clear indication that co-op graduates found graduate employment faster than non co-op graduates, especially those non co-op graduates with no undergraduate DRWE. It took a co-op graduate an average of two weeks to find employment once s/he had actively commenced the search for a job, in contrast to the average 3.5 months that it took a non co-op graduate. If the impact of co-op was merely that students had prior DRWE, then the employment rate and the job search time for co-op graduates would be the same as the employment rate and

job search time for non co-op graduates with DRWE. This, however, was not the case and the co-op graduates had a higher employment rate and a shorter job search time than the non co-op graduates with DRWE who have a higher employment rate and shorter job search time than non co-op graduates with no DRWE. It could be argued that the employment advantages for co-op graduates compared to non co-op graduates is influenced by whether or not they have discipline related employment, either full-time or part-time, during their post co-op studies. It is, however, one of the advantages of co-op, that students have the opportunity to continue with DRWE during their final year of study thereby improving their employability after graduation. Fifty-seven percent of co-op graduates returned to their co-op employer after graduation and were, therefore, placed immediately. This also has implications for the employers where the cost of graduate recruitment would be expected to fall substantially even after taking the cost of co-op recruitment into account. This has been discussed in more detail in Chapter 5.

In terms of pecuniary benefits of co-op, some studies did not account for the extra year of work experience of co-op graduates when comparing their salary levels with those of non co-op graduates (Clark & Zuhair, 1995). Where this problem was addressed (Rowe, 1992), it was difficult to separate the effects of the higher academic grades that had been achieved by co-op graduates compared to non co-op graduates from the graduate starting salaries. This problem was overcome in this current study by targeting non co-op graduates from other universities that offered a similar degree with similar academic entry requirements. While there were still problems with only the high academic achieving non co-op graduates participating in the study, it meant that it was harder to demonstrate any salary benefits accruing to co-op graduates.

Nonetheless, the results of this study showed that the average co-op graduate starting salary was significantly higher than the average non co-op graduate starting salary. The results also indicated that the variability in non co-op salaries after one year in the work force was significantly greater than the variability in average graduate starting salaries for co-op graduates. This variation may have reflected the differences in progression rates of the two cohorts after one year, the type of companies and the type of work that non co-op graduates compared to co-op graduates might find themselves in after one year of recognized industry experience. There was no difference between the average current salary for co-op graduates and the average current salary for non co-op graduates. An explanation for this lack of difference between salaries for co-op graduates and non co-op graduates is that employers, in paying salaries, did not differentiate between the co-op experience of the co-op graduates and the higher final year results of the non co-op graduates.

Employers have often commented that a major priority in graduate selection is the appointment of graduates who are likely to stay with their organizations for a year or more (AAGE, 1999). Some (Wessel & Pumphery, 1995) found that co-op graduates were more satisfied in the workplace, had better career knowledge and therefore, stayed with one company for longer than non co-op graduates. The results in this current study lent some support to these previous findings. While there was little difference between the percentage of co-op graduates compared to non co-op graduates who had high job and salary satisfaction, there was a greater percentage of non co-op graduates who had low job and salary satisfaction. In analyzing the data further, it was apparent that co-op graduates had higher job and salary satisfaction levels than non co-op graduates with no undergraduate DRWE but lower satisfaction

levels than non co-op graduates with undergraduate DRWE. These results may suggest that the non co-op graduates, with no undergraduate DRWE, had a greater impetus to change jobs than co-op graduates did.

The data relating to length of time with the one employer were limited by the time period covered in this study. There was, however, some support that co-op graduates spent an average of two years (out of the two and a half years that they had been working) with the same employer. For non co-op graduates with undergraduate DRWE, the length of time with the one employer was similar, however, this group had an average of over four years work experience. Comparable data could not be tracked for non co-op graduates with no undergraduate DRWE although one Human Resource Manager interviewed estimated that 40% of non co-op graduate recruits resign from the company after a year (Attachment 4). Graduate retention rates therefore still remains an area for future exploration.

Of surprise, was the greater percentage of non co-op graduates compared to co-op graduates who rated their career knowledge as good. Co-op graduates had a wider exposure to the discipline-related job market than the non co-op graduates with no undergraduate DRWE and therefore, they would be expected to also have better career knowledge. Without further investigation, however, it is difficult to know whether the self-rating was an accurate reflection of the respondent's career knowledge. Furthermore, the co-op graduates may have had a better awareness than the non co-op graduates of the breadth of career opportunities available. They may therefore have believed that their career knowledge was very limited.

Another area for future investigation is the impact on the results that a broader sample group of non-cop graduates would have. The non co-op sample group in this current study contained those with very high academic results. Despite this, the results supporting better employment outcomes for co-op graduates compared to non co-op graduates were generally still apparent. This evidence would be even stronger if a better representative sample of non co-op graduates could be obtained.

It would also be of interest to analyze the employment outcomes for various sub-categories of co-op graduates; those who had full-time DRWE post co-op, those who had part-time DRWE post co-op and those who didn't work at all. This area could not be meaningfully investigated in this study, as the sample size of each sub-category of co-op graduates was small with one sub-category only containing seven observations. The results of such a study would enable a more complete comparison of employment outcomes between the three sub-categories of co-op graduates and the two sub-categories of non co-op graduates. This would also help students make more informed decisions about the sort of employment that they should undertake during their final year of study.

Chapter 5

THE IMPACT OF CO-OP ON OTHER MAJOR STAKEHOLDERS

5.0 Chapter 5 Summary.

The results discussed in Chapters 3 and 4 have provided evidence that co-op programs add value to learning and employment outcomes for co-op graduates compared to non co-op graduates. There are, however, three other major groups of stakeholders in co-op programs: the universities offering these programs, the employers of both co-op graduates and non co-op graduates and the government which provides some funds to universities to support the running of these programs (Cutt & Loken, 1995). In order to secure continued support for co-op programs from these stakeholder groups it is necessary to identify the returns on their investment in co-op (Cutt & Loken, 1995). This chapter contains estimations of the costs and benefits of co-op to RMIT University, to a sample of graduate employers and to the Australian Federal Government.

5.1 Benefits and Costs of Co-op to RMIT University.

RMIT University (RMIT) has made a commitment in its Teaching and Learning strategic plan, to provide work-integrated-learning opportunities in every program that it offers (RMIT, 2000e). Co-op is only one model of work-integrated-learning and while a university report (Atchison et al. 1999) identified best practices at RMIT in work-integrated-learning, including co-op, the report did not have a brief to cost these practices or to measure their outcomes.

5.1.1 Method used to identify benefits and costs to RMIT of co-op.

RMIT's Teaching and Learning Strategy (RMIT, 2000e) was used to ascertain the targeted outcomes that could be influenced by co-op. The following goals and performance indicators were identified as relevant:

- The attraction to RMIT of quality students measured by high demand per place
- High student achievement measured by GPA, high student retention rates, progression rates and completion rates in programs.
- RMIT graduates who are eminently employable as measured by graduate employment outcomes.
- RMIT graduates who are committed to career-long learning as measured by graduates returning to formal study

Each program at RMIT can be evaluated in terms of its contribution to the realization of these goals.

The relevant results relating to academic and employment outcomes from Attachments 5 and 6 were summarized and analyzed for the impact of the RMIT Economics and Finance co-op program on the achievement of these objectives. Data were also gathered from university records to estimate the cost of running this program. The framework used was consistent with the estimation of co-op costs to universities undertaken by Pickles (1998) who identified the relevant costs as being salary costs of the placement manager and academic staff involved in mentoring, and travel costs involved in visiting students out on placement. In addition to these variable costs, an estimation was also made of the fixed cost to RMIT of providing this co-op program.

Comparisons were also made between employment outcomes related to the specified objectives for co-op graduates and non co-op graduates. These were based on relevant results from Attachment 5-2 and 6-2, and from a focus group comprising a small group of non co-op graduates, held in order to understand their motives for university and program choices as well as to explore employment related issues (Attachment 2-4).

5.1.2 The influence of co-op on university preferences of in-coming students and on student views of their study program.

Graduates were asked in the questionnaires (Attachment 2-3) to rate the importance of co-op in their program selection decision and to identify what choices they would make with hindsight.

The results of these questions are detailed in Attachments 5-1 and 6-1 and are summarized in Tables 25 and 26 below.

Table 25: The Importance of Co-op in Course Selection.

Importance of co-op in program selection*	Number of co-op graduates	Number of non co-op graduates with no UG DRWE	Number of non co-op graduates with UG DRWE
Low importance	5	17	7
Neutral	7	7	3
High importance	19	2	2
Total	31**	26	12**

*Scores of 1or 2 indicated that co-op was a factor of low importance in program selection whereas scores of 4 or 5 indicated that co-op was a factor of high importance in program selection.

** One graduate from each of these groups did not respond to this question

From Table 25 it can be seen that over 60% of the 31 co-op graduates said that co-op was an important factor in the selection of their program while 66% of the 38 non co-op graduates said that co-op was of little or no importance to their program selection. These results are not surprising given that the average university entry standards that were met by the co-op graduates and the non co-op graduates in this study did not differ significantly. This suggests that a non co-op graduate could have selected a co-op university program had s/he chosen to do so.

Table 26: What Program Selection Decision Would be Made With Hindsight.

	Number of co-op graduates	**Number of non co-op graduates with no UG DRWE**	**Number of non co-op graduates with UG DRWE**
Same degree with co-op	20	16	11
Same degree w/out co-op	0	7	2
Different degree with co-op	9*	1	0
Different degree w/out co-op	2	1	0
Indifferent		1	0
Total	31	26	13

*Five of these nine students said that they would choose the Financial Planning degree which is very closely aligned to the degree in Economics and Finance and is only offered in Australia by RMIT's School of Economics and Finance.

Of interest in Table 26, is the 94% of co-op graduates and 72% of non co-op graduates who would, with hindsight, have chosen to undertake a co-op degree even if it was in a different discipline area to the one that they had studied. The implication for RMIT is that there is a pool of students of high academic

achievement who could be attracted to their programs with co-op, if the knowledge and understanding of the benefits of co-op could be transmitted to them at the time of university selection.

The balance between the demand for, and the supply of, university places determines the TER score. An assessment was undertaken, based on the TER, of the relative demand for the co-op degree compared to the non co-op degree. It was found that the demand for the co-op and non co-op degrees were similar since the TER scores for the different cohorts in the study were not significantly different ($t=0.74$, $p=0.46$, Attachment 11-1). There are, however, other factors that could be said to influence the "reputation of a program" and consequently the demand for places into that program. To explore the "reputation" of the degree, co-op graduates and non co-op graduates were asked to comment on their perceived value of the degree that they had completed.

In analyzing the responses to the question on the major benefits of the degree studied (Attachments 5-1), 15 out of the 31 co-op graduates identified the co-op experience as a major benefit. Eight respondents said that the degree also provided practical learning while another eight said that the degree provided them with a good knowledge of finance. Seven respondents said that the major benefit of their degree was that it opened the door to a job. The focus of these responses was on the value of applied learning and on how the degree enhanced their job opportunities.

For non co-ops with no undergraduate DRWE, 15 out of 26 identified the major benefit of their degree to be the finance knowledge or the knowledge that they gained about the discipline. Another six identified the major benefit of their degree as increasing their career options while four said that a degree was necessary to get a job and three said that their degree helped prepare them for the workplace (Attachment 6-1). The focus of the responses from the non co-op graduates seemed to be on the value of the degree in providing discipline-related knowledge and career options. In exploring this issue with a focus group of non co-op graduates (Attachment 2-4), a common theme was that they believed that their business degree had helped them to develop some technical skills required in the job (eg. Statistics and Accounting) but for two of them, their problem solving skills had been developed through their Arts degree. While each of the focus group members had undertaken study in finance courses, few were using the finance knowledge in their current job.

One interpretation of the differences in the comments made by the co-op graduates compared to the non co-op graduates is that co-op graduates emphasized the importance of learning but their focus appeared to also be on short-term job acquisition. Non co-op graduates seemed to value knowledge as opposed to learning, however, their views reflected a broader career rather than a job perspective. This is supported by the views expressed by non co-op graduates in the focus group discussed in more detail in section 5.1.4 (p. 115).

5.1.3 The effect of co-op on student progression, retention and completion rates.

Once students have accepted their places into RMIT, one of the university's key performance indicators is the progression rate of these students through their programs (RMIT, 2000e). A comparison of progression rates through their degree for co-op graduates and non co-op graduates is made in Table 27 based on data summarized from Attachments 5-1 and 6-1.

Table 27: Time to Complete Degree

	2 yrs	**3 or 3.5 yrs*** **	**4 yrs**	**4.5 yrs**	**5 yrs**	**5.5 yrs***	**6 yrs***	**7 yrs***	**Total (nos)**
Co-ops**	0	5	7	9	5	1	1	1	**29**
Non co-ops SD#	0	10	5	0	1(Hons) +2	0	2	0	**20**
Non co-ops DD##	1	0	2	1	0	0	2	0	**6**

* progress prior to co-op was very slow with the first 2 years of the degree taking up to 4 years
** there are 2 co-op students who have not yet completed their studies
*** these students gained exemption for part or all of their first year studies
#SD = Single degree
##DD= Double degree

Since the six non co-op graduates who had undertaken a double degree had only provided commencement and completion dates for the business degree, it was not possible to estimate their progression rate. Of those who had undertaken a single degree, 50% either completed their program within the minimum time or took an additional semester to do so. This meant that the remaining 50% took an

additional year or more to complete even though they were, on average, high academic achievers[1].

[1] This is the case even for the non co-op Honours graduate who would have been expected to complete his/her degree in four years but took five years instead.

In contrast to these figures, 67% of the co-op graduates completed their degree in the minimum time of four years (or less if they received exemptions for courses previously passed), or took an additional semester to complete their studies. Of the ten co-ops (or 33%) who took an additional year or more to complete their degree, three of them had taken 3.5 or more years to complete the first two years of their degree. These three students successfully completed their co-op requirement in the prescribed time and then went on to finish their degree in the following year.

The figures in Table 27 therefore, provide support for the proposition that a higher percentage of co-op graduates compared to non co-op graduates had progressed through their degree within the minimum time plus a semester. Furthermore, while the sample size of co-op graduates who have not completed the degree within a year of the minimum time, is small, co-op and final year students returning from co-op, when interviewed talked about co-op increasing their motivation to learn and enhancing their work ethic (Attachment 2-2).

These comments are consistent with the progress of the three graduates who had very poor progression prior to co-op and then completed their degree in the minimum time of one-year post co-op. Larger sample sizes and more detailed information is, however, needed in order to explore more accurately the impact that co-op has on the academic progression rates of students.

Academic data for second year, co-op, and final year were accessible for all the Economics and Finance students before graduation (Attachment 5-1). These data

provided evidence that 97% of students, who reached co-op, went on to complete their degree. Comparable figures, however, were not available for the non co-op cohort as only graduates were targeted and no access was available to students who had dropped out before completing their studies. These data need to be available for a more accurate assessment of the effect of co-op on student retention rates to be made.

5.1.4 Graduate employability.

RMIT's objective is to provide ' …quality learning tailored for students and clients for employment, leadership and career-long learning…' (RMIT, 2000e, p. 4)

In measuring graduate employment outcomes, the results discussed in Chapter 4 established that co-op graduates took a much shorter time on average, to find graduate employment than non co-op graduates. The results also supported the 100% co-op graduate employment within six months of degree completion as opposed to the figure of 85% for the non co-op graduates with no undergraduate DRWE. It should also be noted that the national statistics (Graduate Destination Survey, 2000) showed an even greater differential between the employability of co-op graduates compared to non co-op graduates. This discrepancy between the national statistics and the results obtained in this study has arisen because this study has only captured the high academic performing non co-op graduates who are more likely to find early graduate employment than low academic performing graduates.

5.1.5 Encouraging career-long learning.

Another university objective is to develop career-long learners. Again the sample sizes were small and the co-op graduates had on average completed their degree within the year prior to answering the questionnaire. Non co-op graduates had completed their degree on average two years prior to answering the questionnaire. While career-long learning does not necessitate taking on formal study immediately after degree completion, it is interesting that under 30% of co-op graduates compared to 65% of non co-op graduates were currently undertaking formal study at the time the survey was undertaken (Table 28). It could be argued that non co-op graduates believed that they needed to add further value to their undergraduate degree while the co-op graduates may have believed that they were well prepared for the work force. The results in Table 28 did not, however, support this explanation. The most likely graduates to continue with formal study were the non co-op graduate with undergraduate DRWE although these results need to be tempered by the small sample size of 13. This group of graduates had an average of over four years of DRWE compared to an average of just over two years for co-op graduates (Table 16, p. 90). This suggests that graduates may be more likely to return to formal study after they had several years work experience and had identified their future education needs.

Table 28 Continuing Formal Study (other than finishing degree).

Post degree studies	Number of co-op graduates	Number of non co-op graduates with UG DRWE*		Number of non co-op graduates with no UG DRWE	
		SD	DD	SD#	DD##
Yes	9	4	4	8	1
No	22	3	2	9 + 1(Hons)	7
Total	31	7	6	18	8

* Most likely group to continue study is the non co-op cohort with DRWE: 8/13 or 61.5% continuing with formal study.
\# Single degree
\## Double degree

5.1.6 The cost to the university of co-op.

While it was difficult to estimate a return on investment of co-op given that some of the benefits of co-op are non-quantifiable, the following data in Tables 29 and 30, provided the framework for an estimate of the fixed and variable costs of running a co-op program to be undertaken. Table 29 contains the calculations for the labor costs incurred by the RMIT University's School of Economics and Finance that provided the co-op program for the co-op graduates in this study. Even though the co-op students undertook their work-placements off-campus, they spent the preceding semester undertaking an on-campus work preparation program. An allocation of fixed costs was therefore also estimated (Table 30). Once all the costs were identified, a total cost for each co-op student was calculated and compared to the total funding received for each co-op student.

Table 29: Estimated Labor Cost of Running a Co-op Program.

Activity/Personnel	**Total Estimated Cost, $**
0.4 of total cost for a half-year of a full-time senior lecturer ($39,014) to run the work preparation program	15,606
0.3 of total cost for a year of a full-time senior lecturer ($78,028) to support learning of co-op students out on placement	23,408
0.8 of total cost for a half-year of a full-time Industry Placement Manager ($22,014) to find co-op placements and to support the work preparation program	17,611
0.2 of total cost for a year of a full-time Industry Placement Manager ($44,028) to support learning of co-op students out on placement	8,806
Total cost for a year of an academic mentor to visit co-op students while out on placement (including the time taken to arrange the visits and travel time).	23,592
Total Labor cost associated with the preparation and placement of one co-op cohort (RMIT, 2000c)	**$89,023**

Table 30: Estimated Labor Cost Plus Overhead Cost Allocation Per Co-op Student.

	Estimated cost per co-op student
Labor cost per co-op student [calculated by averaging the two cohorts per year, one of 50 co-op students and the other of 20 co-op students from all programs offered by the School to local and international students]	$2,544
Overhead cost allocation per student [This was calculated on the basis of overhead costs of $2.39m (RMIT, 2000d) per annum divided by 812.8 EFTSU* in that year (RMIT, 2000b), divided by 8 to give an overhead allocation per course. Co-op students used classroom facilities for an equivalent of one-and-a-half	$ 600

courses; one course for the work preparation program and the rest for on-campus reflection sessions held while co-op students were out on placement]	
Total cost to the School of each co-op student	**$3,144**

*Equivalent full-time student unit.

The estimated cost to RMIT's School of Economics and Finance of providing a co-op program to students placed in Melbourne businesses, was approximately $3,100. The additional costs involved in mentoring co-op students placed interstate or overseas have not been included in the cost calculations, as they were not relevant to the cohort being studied.

The government funding provided to the School for each EFTSU was $9194.11 per annum (RMIT, 2000a & b). However, the funding by the government for a co-op student was only 0.2 of an EFTSU. This equated to approximately $1,840 per year per co-op student going to the School of Economics and Finance. This has left a funding shortfall for a co-op program of approximately $1,300 per co-op student.

RMIT University has recognized the benefits of work-integrated-learning and is committed to 'integrating work into the curriculum' (RMIT, 2000e). While this study has not evaluated the effectiveness of co-op compared to other forms of work-integrated-learning, the evidence does support the effectiveness of co-op in contributing to the achievement of the university's goals as measured by its key performance indicators. The challenge remains, however, of meeting the funding shortfall of approximately $1,300 per co-op student or the additional funds of

$1.04m required annually by RMIT Business to provide co-op to its 800 students per year who are currently engaged in this program[2].

There are two other major stakeholders in co-op programs - employers and the government. If it can be demonstrated that these stakeholders receive financial benefits on top of any other benefits, from their engagement in co-op programs, then this may provide a basis for the university to negotiate some recovery of their costs involved in creating the opportunities for these co-op benefits.

5.2 Cost and Benefits of Co-op to Employers.

Some studies into the benefits of co-op to employers have focused on discussing the benefits derived from employing co-op students rather than analyzing the impact of co-op on graduate employment programs (Braunstein, 1999; Cutt & Loken, 1995; Eames et al. 1996; Young, 1997). Eames et al. (1996, p. 9) did, however, ask two employers from medium-sized companies to estimate the savings in graduate recruitment costs that can result from their involvement in co-op programs. They commented that this saving was so large as to 'show real financial benefits to organisations (of) … a Co-op Programme'. The significantly lower costs of recruiting co-op compared to non co-op graduates resulted from lower costs of advertising, selection and training (Eames et al. 1996; Eames & Kumar, 1997).

There may also be other benefits of recruiting co-op graduates such as lower labor turnover rates, better productivity, faster progression through the organization and the

[2] These estimates are based on the assumption that the cost per Economics and Finance co-op student is the same for each other co-op student in RMIT Business.

ability for employers to give co-op graduates, compared to non co-op graduates, more responsible positions (Hurd & Hendy, 1997).

Wessels and Pumphrey (1995), however, found that being in co-op had little effect on the graduate turnover rate in companies unless graduates returned to their co-op employers, which then led to a reduction in their probability of changing jobs from 53.1% to 42.7%. If the number of co-op graduates remaining with their employers was small then only a few employers would experience the financial benefits of co-op associated with the lower job turnover rate and lower recruitment costs.

In order to determine the influence of co-op on the costs of recruiting Banking, Economics and Finance graduates, it was important to analyze the job turnover figures and any differences in recruitment and training costs for co-op graduates compared to non co-op graduates. 'Studies further investigating the costs and benefits (to employers) of participation in cooperative education is still an important area for research' (Hurd & Hendy, 1997, p. 60).

5.2.1 Method used to identify costs and benefits to graduate employers of co-op.

In this current study, the first stage of gathering data on employers' views of the benefits that co-op brings to their organizations, involved the analysis of the questionnaires that had been distributed to employers at the end of the placements of the 1998 Economics and Finance co-op students (Attachment 3). Relevant results pertaining to the turnover and retention rates of co-op graduates compared to non co-op graduates (Attachments 5-2 & 6-2) were also analyzed.

To explore the costs and benefits of co-op programs further, the Human Resource Managers of three companies that are involved in co-op programs, and also have a formal graduate recruitment program, were interviewed. These three companies accounted for the employment of at least 36 out of the total of 69 respondents, of which 30 out of the 39 were non co-op graduates whose results were used in this study (Attachment 5-2 & 6-2). The interview questions are provided in Attachment 4. One of the major objectives of the interviews with these managers was to estimate recruitment and training costs involved in hiring co-op students and in hiring graduates.

5.2.2 How the co-op students were viewed by their employers.

A summary of the 23 responses from co-op employers who had completed an evaluation of the co-op program and the contribution that the co-op students, later to become the co-op graduates in this study, had made to their organizations is given in Attachment 3. Twenty-two employers agreed that the co-op student employed by their organization added value to the company. Of these employers, 17 stated that they also agreed that this added value was greater than the cost of employing the co-op student. Twenty employers agreed that the skill levels of the students were adequate for the job while 13 agreed that the co-op student introduced new ideas to the company. Nine of the remaining ten employers were undecided whether this was the case. Only 11 employers agreed that co-op was a vital part of the company's Graduate Recruitment Program.

5.2.3 The effect of co-op on graduate turnover rates.

That fewer than 50% of employers viewed co-op as a vital graduate recruitment strategy is particularly interesting given the data in Table 31 that show the study/work choices made by students after they had completed their co-op placement. The data in Table 31 (summarized from Attachment 5-2) show that 47% of the Economics and Finance co-op students continued full-time with their co-op employers while continuing with part-time study. Sixty-seven percent of the co-op students continued either full or part time with their co-op employers while 77% returned to some degree-related work. Of those who returned to degree-related work, 87% returned to their co-op employer. Furthermore, 57% of all the co-op students continued with their co-op company after graduation and therefore stayed with the company for at least three years. These figures support the continued contribution that co-op students made to companies after they have completed their co-op placement and they also suggest that co-op graduates made a positive contribution to the company's graduate recruitment program.

Table 31: Study/Work Choices Made by Students Post Co-op.

	FT study with no DR work	**FT study and PT work with co-op employer**	**FT study and PT work with non co-op employer**	**PT study & FT work with co-op employer**	**PT study & PT work with co-op employer**	**PT study & FT work with non co-op employer**	**Total**
Decision post co-op	23%	17%	7%	47%	3%	3%	n=30
	Number returning to co-op employer	**Number returning to co-op employer**	**Number returning to co-op employer**	**Number returning to co-op employer**	**Number returning to co-op employer**	**Number returning to co-op employer**	**Total number returning to co-op employer**
Decision post degree	0	4	0	12	1	0	17

It would be of interest in analyzing job turnover rates, to examine how long the co-op graduates stay with their first graduate employers, compared to non co-op graduates. There is some evidence that co-op graduates have a lower job turnover rate than non co-op graduates (Table 19, p. 98), however, the sample sizes used were small and the time span over which data were collected was short thereby limiting the reliability of the estimates of job turnover rates. Wessels and Pumphrey (1995) overcame the problem of determining the job turnover rate given a short study time frame, by asking for graduates' opinions on whether or not they intended to remain with the company that was currently employing them. The reliability of the answers obtained from this method could also be questioned, as there may be a gap between the intentions and the actions taken by graduates. As this is still an important area to explore, it is suggested that the time frame for future studies be extended so that results could be based on historical measures of actual turnover rates of co-op graduates compared to non co-op graduates, thereby improving their reliability.

5.2.4 The effect of co-op on graduate recruitment costs.

While the graduate turnover rate is one important factor to consider in estimating the long-term company recruitment costs, there are other factors, such as advertising, selection and training costs that need to be taken into account. There may also be other benefits to employers, yet to be considered, of hiring co-op graduates. In order to explore these factors further, the three Human Resource Managers who were interviewed were asked to comment on any advantages of hiring co-op graduates compared to non co-op graduates. They were also asked to

estimate the costs of recruiting graduates as opposed to co-op students. This enabled an estimate to be made of any cost savings that accrued to co-op companies that kept their co-op students on as graduate recruits.

The Human Resource Managers commented that the advantages of hiring co-op graduates compared to non co-op graduates included productivity gains, a method of pre-selecting employees as well as the reduced cost of recruitment. All three managers talked about co-op helping both the company and the graduate make appropriate employment decisions. The implication of this is that staff turnover and its associated costs will therefore be reduced and productivity may well increase with realistic expectations of the job.

> Co-op graduates have a proven track record in the work environment and even if they haven't worked for this company (during co-op), they still get preference over non co-op graduates… There is very little difference between the productivity of a co-op student and a graduate recruit (even though) co-op students (unlike graduate recruits) do not receive formal training… Co-op is a great way to "try before you buy" however as a resource it is not maintained in the way that it should be.
>
> (Human Resource Manager 1, July 2001)

> Co-op students provide a ready pool of possible employees. (Managers) have an opportunity to assess whether they want the co-op student to come back (and if so), the advantages of taking on co-ops is that you can get people on board without the cost of a graduate program…
>
> (Human Resource Manager 2, July 2001)

> Co-op students are viewed as graduates and take on the same functions. We select co-op students using the same criteria used for graduates but we don't expect them to score as high. The advantage of having a co-op student return as a graduate is that they have experienced the organization for at least a year, they have accepted the position and they can see themselves in the role…. They have better expectations of the company and the profession…
>
> (Human Resource Manager 3, July 2001)

Using the figures provided by the three Human Resource Managers, the following estimates of co-op student and graduate recruitment costs were developed and are presented in Table 32 below.

Table 32: Co-op Student and Graduate Recruitment Costs

Recruitment Costs	**Company 1**		**Company 2**		**Company 3#**	
	Co-op student	**Graduate**	**Co-op student**	**Graduate**	**Co-op student**	**Graduate**
Total Cost Per Recruit	$800	$3,700*	$1,100	$2,200**	$5,000	$8,000

* The cost of hiring a graduate outside of the graduate recruitment program is in excess of $5,000

** This figure includes outsourcing plus all in-house costs. The figure is significantly higher in States other than Victoria due to the high costs of advertising.

\# Company 3 used a full cost allocation model for estimating recruitment costs. The figures also included training costs that both co-op students and graduate recruits undertake.

The estimated figures in Table 32 enabled an analysis to be made of the companies' graduate recruitment costs when a graduate who had not worked for the company before was hired, compared to the company converting a co-op student into a graduate recruit. Even though each organization had a unique way of calculating their recruitment costs, there was an internal consistency between

the calculation of the co-op student and the graduate recruitment costs. For example, Company 1 only included recruitment costs, however, if a co-op student became a graduate recruit then s/he would undergo the same training program and therefore, incur the same training costs as any other graduate recruit. Company 3 on the other hand, included the same cost of training for both co-op students and graduate recruits. In both cases the difference between the cost of co-op student recruitment and the graduate recruitment cost is a reflection of the potential savings to the company of having a co-op student become a graduate recruit. For Companies 1 and 3, this saving was approximately $3,000 while for Company 2 the saving in graduate recruitment costs brought about by co-op was $1,100 for every co-op student who became a graduate recruit. If the figure of 57% of the Economics and Finance co-op students who returned to their co-op companies as graduate recruits (Table 31, p. 123), is typical for RMIT Business, then this would mean that the savings to the co-op companies would be between approximately $0.5m and $1.4m[3].

The evidence presented in section 5.1.6 (p. 117) indicated that RMIT bears a cost above the funding received of $1,300 per co-op student or $1.04m annually. It could therefore be argued that given the cost savings experienced by companies who have recruited their co-op students as graduates, RMIT University could off-set some of the costs associated with running co-op programs by negotiating a fee paid by these companies for the provision of this service.

[3] This figure is calculated on the basis of cost savings per co-op student times 57% of the 800 co-op students in RMIT Business who undertake co-op annually.

Given that more than 77% of co-op employers stated that co-op students added more value than cost to their organizations (Attachment 3), this provides another avenue that could be investigated in order to determine whether a co-op student placement fee paid to the university by co-op companies, is also justified.

5.3 The Macroeconomic Effect of Co-op.

Apart from the co-op benefits that accrue to co-op stakeholders including students, graduates, universities and employers there are also macroeconomic benefits that have been associated with the availability of co-op programs (Jacobs, 1997).

5.3.1 The repayment of the Higher Education Service Fee by graduates to the government.

As discussed in section 5.1.6 (p. 117), the Australian Federal Government provides funding for co-op students at a lower rate than for on-campus students. This reflects the lower resource requirements for co-op students but does not account for the impact that co-op may have on a macroeconomic level. Jacobs (1997) pointed out that if co-op encouraged students to continue with their education, then co-op would be making a contribution to the development of human capital and therefore to increased productivity. In this study, both co-op graduates and non co-op graduates had completed tertiary study and hence the increased productivity would have risen because 'co-op provides opportunities and incentives that "ordinary" education cannot provide' (Jacobs, 1997, p. 157). The outcomes of these opportunities in either academic or employment outcomes have already been discussed, however, there are also direct macroeconomic benefits that can be associated with the provision of co-op programs.

Jacobs (1997) also argued that co-op leads to a more independent labor force that in turn can lead to a reduction in social and welfare spending. While he did not measure this reduction, his comments provided the incentive to investigate what impact co-op has had on Australian Government services.

Students in Australia are charged a higher education service fee (known as HECS), for each course that they undertake and for which they have not paid a full fee directly to the university. The HECS can be paid to the government at the start of each academic semester or deferred until a threshold income is earned, at which time a percentage of the HECS outstanding needs to be paid back to the government. The amount repaid annually depends on the income level earned and contributes to the government budget. An increase in the government budget enables an increase in government expenditure which, through the multiplier effect, leads to an increase in economic activity and consequently an increase in government tax revenue.

A comparison was made between the levels of HECS still owing by co-op graduates compared to non co-op graduates (Table 33) in order to estimate this indirect impact of co-op on government revenue.

From Table 33, it can be seen that 54% of non co-op graduates still owed $5,000 or more in HECS as opposed to 43% of co-op graduates. Also 42% of non co-op graduates compared to 23% of co-op graduates had totally repaid their HECS debt. There were, however, significantly more co-op graduates compared to non

co-op graduates who had a current debt of between $0 and $5,000. A lower expected overall debt to the government from co-op graduates compared to non co-op graduates was also estimated.

Table 33: HECS Liability of Co-op Graduates and Non Co-op Graduates.

Current HECS Liability	Co-op graduates		Non co-op graduates		Expected** co-op HECS debt	Expected** non co-ops HECS debt
	No.	%	No.	%		
0	7	23.3	11	42	0	0
0<$5000	10	33.3	1	4	8,325	100
***$5000+**	13	43.3	14	54	63,045	84,672
Total	30		26		$71,370	$84,772

* Total HECS for a 3-year non co-op or a 4 year co-op Finance degree = $17,400

**Expected debt is calculated by multiplying the average HECS liability in each category by the probability of graduates incurring that liability (e.g. $2,500 x 0.04 = Expected debt of $100)

5.3.2 The payment of government unemployment benefits to graduates.

Another aspect of government expenditure that can be linked directly to changes in the labor market, is the payment of unemployment benefits (called Newstart Allowance). If co-op leads to increased opportunities of graduate employment and graduate job search time is concomitantly reduced, then demand for unemployment benefits would be expected to fall.

The results in Table 14 (p. 84) confirm that there was 100% of employability for co-op graduates within six months of active job search compared to 85% for non

co-op graduates. Ninety percent of co-op graduates found employment within one month of actively seeking work compared to 19% of non co-op graduates. Furthermore, it took co-op graduates an average of approximately two weeks to find graduate employment compared to almost three and a half months for non co-op graduates with no undergraduate DRWE (Table 15, p. 86).

These comparisons of graduate employability and job search times do not directly demonstrate a macroeconomic impact unless the job search time was associated with a claim for unemployment benefits. Results from the questionnaire related to employment outcomes (Attachments 5-1 & 6-1) show that only one co-op graduate received unemployment benefits and this was for one month. In contrast, of the 26 non co-op graduates with no undergraduate DRWE, 19% claimed unemployment benefits for periods of time that varied from one week to five months with an average of two and a half months.

Current unemployment benefits for a single person are approximately $180/week/person (Centrelink, 2001a). Given the above unemployment figures, the unemployment costs for the co-op graduate is approximately $800 while for each of the five unemployed non co-op graduates, the government has paid out on average, approximately $1,980. The total unemployment benefits paid to the non co-op graduates with no undergraduate DRWE in this study, is therefore approximately $10,000. Table 34 shows the expected unemployment benefits that would be paid if there were 800 co-op graduates and 800 non co-op graduates[4].

[4] Figures for Victoria for the number of co-op Banking, Finance or Commerce (BFC) graduates and non co-op Banking, Finance or Commerce graduates are not available. To enable a comparison of

Table 34: Expected Total Unemployment Benefit Payments

	Annual no. of graduates	Probability of being unemployed	Unemployment benefit	Total expected pay-out
Co-op Business Graduates	800	0.03	$ 800	$ 19,200
Non Co-op Business Graduates	800	0.19	$1980	$300,960

Because co-op has a positive effect on employment outcomes, it also has an influence on reducing the reliance on government unemployment benefits. The extent of these benefits will depend on the actual number of co-op graduates and non co-op graduates in any one year and the labor market conditions that they face.

Although the calculations in Table 34 have been based on estimates, it is evident that co-op can have a very powerful effect on government expenditure on unemployment benefits.

It could even be argued that the estimated unemployment benefits paid out to non co-op Business graduates of approximately $300,000 is an underestimation given that it is based on the probability of being unemployed and the average time unemployed of non co-op graduates in this study. The non co-op graduates in this

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expected unemployment benefits paid by the government to BFC co-op and non co-op graduates, the figure of 800 RMIT Business co-op graduates was used as a proxy and matched with 800 non co-op Business graduates. The assumption made in undertaking the calculations in Table 34 is that the analysis undertaken for BFC graduates can be generalized to Business graduates. In reality, there are many more non co-op Business graduates than co-op Business graduates in Victoria. The calculations in Table 34 are therefore an underestimation of the expected unemployment benefits paid to non co-op Business graduates.

study are, however, all high academic achievers compared to what would be expected from a population group of graduates. It could therefore be argued that these high academic achieving non co-op graduates would have a lower job search time and a lower reliance on unemployment benefit than non co-op graduates with lower academic grades.

A counter argument is that these high academic achievers are prepared to take a longer time period and to stay on unemployment benefits until they have found the job that they want. A sample of a larger cross section of non co-op graduates would need to be taken and more information about any time spent on unemployment benefits would need to be gained in order to explore this issue further.

There does, however, seem to be enough evidence to support the proposition that co-op has resulted in improved employment outcomes and consequently there has been a reduction in the reliance of co-op graduates on unemployment benefits. Although the extent of this reduction needs to be further investigated, co-op universities should be encouraged to seek an increase in government funding for co-op programs, given that the Australian Government benefits from these programs through reduced social welfare expenditures.

5.3.3 Payment of Austudy.[5]

[5] Austudy has previously been defined in footnote 5 on page 25

Another area of government support is that of Austudy. The data in Attachment 5-1 & 6-1 show that once again a lower percentage of co-op students compared to non co-op students depended on Austudy and the co-op students who did, spent a shorter time receiving this government support for study. Of the 30 co-op students, eight or approximately 27% were on Austudy for an average of two years prior to undertaking their co-op year. Only two (7% of post co-op students) received Austudy in their final year of study and this was for two weeks for one student and two months for the other. With an Austudy payment of $145/week (Centrelink, 2001b) received in final year, this meant an average payout to a post co-op student of $770/person.

In contrast to this, ten of the 26 non co-op students or 38.5%, received Austudy throughout their studies and for nine students (35%), it was for the length of the degree with the average time for receiving Austudy being 3.85 years, almost twice the time that co-op students received Austudy. This meant that the government needed to fund non co-op students for an average of 1.85 years after their second year of study with an average Austudy pay-out per student after second year of approximately $14,000.

Using the same assumptions that were made to develop the estimates in Table 34 (p. 132), the following comparison between the expected total Austudy payment to final year co-op students and final year non co-op students was developed (Table 35).

Table 35: Expected Total Austudy Payments post Second Year

	Annual no. of Business graduates	Probability of being on Austudy	Austudy payment per final year student	Total expected payment in final year
Co-op Business graduates	800	0.07	$ 770	$43,120
Non co-op Business graduates	800	0.35	$14,000	$3.9m

The figures in Table 35 provide evidence that the co-op experience has led to a significant reduction in reliance on Austudy of final year students. There was a lower likelihood of co-op students receiving Austudy prior to undertaking co-op compared to that of non co-op students prior to final year (Attachments 5-1 & 6-1). This differential increased substantially in the final year of study. The probability of receiving Austudy by students returning from co-op (0.07) was significantly lower than the probability of receiving Austudy by non co-op students in final year (0.35). The main reason for this shift away from the dependence on government income support by post co-op students is that 77% of co-op students returned to some form of DRWE after co-op and those who did not, took on part-time non discipline-related work. These figures help sustain the argument for additional funding support from the government for university co-op programs.

5.4 Summary of the Impact of Co-op on Other Major Stakeholders.

The data presented in this chapter have provided evidence of the benefits of co-op to the RMIT, the university offering the program, to graduate employers particularly

those who have retained their co-op students as graduate recruits, and to the Australian Federal Government.

Evidence of the contribution made to RMIT's achievement of its strategic objectives, was presented. The academic achievement of some students, particularly those with a poor pre co-op API, improved significantly post co-op. There was some support that the academic progression rates of co-op students was faster then the academic progression rates of non co-op students, and all co-op students had remained at RMIT post co-op to complete their studies. The co-op students in this study also had 100% employability within six months of degree completion compared to a figure of 85% for the non co-op graduates. Whether or not co-op has an impact on a graduate's propensity for career-long learning is an area that requires further investigation.

The response, particularly from non co-op graduates, to the question of what undergraduate degree program they would have, with hindsight, selected, indicated that there is an opportunity for RMIT to increase the demand for its co-op programs by improved marketing of its co-op programs to secondary school students. The cost to RMIT of providing the co-op program to the 32 co-op graduates in this study was estimated to be approximately $100,000 (or $3,100 for every co-op student) yet RMIT only received approximately $60,000 in government funding (or $1,840 per co-op student). This shortfall of approximately $40,000 for 32 co-op students (or $1.04m for 800 co-op students) needs to be met to support the long-term sustainability of co-op programs.

Evidence was presented to support the proposition that employers believe that the value to their organization of employing a co-op student was greater than the costs incurred. From the data, it was also evident that almost 60% of co-op students returned to their co-op companies after graduation and stayed with them for at least three years. It was estimated that for companies where this occurred, the savings for all the companies varied between $0.5m and $1.4m in total graduate recruitment costs.

It was also found that the Australian Federal Government was a beneficiary of the co-op program. The expected overall HECS debt to the government was lower for co-op graduates compared to non co-op graduates. Furthermore, the government paid the non co-op graduates in their final year of study and prior to obtaining graduate employment, a total in unemployment and Austudy benefits of $150,000. This compared to a total of $2,400 paid in unemployment and Austudy benefits to co-op graduates in their final year of study and prior to obtaining graduate employment.

The data presented in this chapter provided support for the added value of the co-op program evaluated in this study, to its other major stakeholders: RMIT, graduate employers, and the Australian Federal Government. To determine whether these benefits can be generalized to other co-op programs, a larger longitudinal study of co-op programs offered in a range of discipline areas would need to be undertaken.

Chapter 6

CONCLUSIONS ON THE ADDED VALUE OF A COOPERATIVE EDUCATION PROGRAM

This study has addressed the question of what is the added measurable value of a co-op program. The value of co-op was defined by its outcomes for students, graduates, RMIT University, graduate employers and the Australian Federal Government. The research into these outcomes was therefore undertaken for each of these stakeholder groups. The impact of co-op on student approaches to learning, on the academic performance of students and on the employment outcomes of graduates was investigated. The contribution of co-op to the achievement of RMIT's strategic objectives was also discussed and the gap between the funding that the university receives for co-op and the cost of running the program was identified. An argument was presented that additional resources for co-op programs could be obtained by RMIT from graduate employers and the Australian Federal Government as the financial benefits of co-op to these two stakeholder groups exceeded the costs of their involvement in co-op.

In examining the impact of co-op on student approaches to learning, it was found that fewer students adopt a Reproducing Orientation (RO) to learning when they were in the workplace compared to when they were on campus. There was, however, a high percentage of co-op students who were syllabus bound and the scores on the *Fear of Failure* sub-scale for co-op students was not significantly different from the *Fear of Failure* scores for second year and final year students.

A higher percentage of students adopted a Meaning Orientation (MO) to study during co-op than in their second year of on-campus study thereby supporting the proposition that students' approaches to learning while studying on campus do differ from those adopted in the workplace. Some contradictory results are, however, evident in two of the MO sub-scales and an analysis of variance showed no significant differences in *Comprehension Learning* between second, co-op and final year students.

The unexpected results on the various RO and MO sub-scales may have arisen because of the timing of the testing. Students were asked to complete the Approaches to Study Inventory early in the year and hence the impact of co-op may yet to have been felt, resulting in an understatement of sub-scale scores. The need to provide additional learning support that will help co-op students translate their work experiences into learning outcomes may also be an important factor influencing the results.

Co-op students and students entering the final year of their degree reported that their approaches to study were influenced by their co-op experience and they expressed a desire to adopt a MO to study. This desire was not always translated into action and a lower than expected percentage of co-op students and final year students adopted a MO to study. One possible explanation for these results is that a greater emphasis needs to be placed on learning and engaging students in reflective practice during co-op. Furthermore, while students entering final year wanted to adopt a MO to study, their intentions were not always fulfilled. This may have been due to the approaches to teaching adopted by the academic staff that did not encourage a MO in the students. The impact that academic staff have on student approaches to study is an

area that needs further investigation. It is also possible that Richardson's Approaches to Study Inventory was not as suitable for measuring learning in the workplace as it is for measuring the approaches to learning adopted by students in a university environment.

The Approaches to Study Inventory was used in an effort to determine whether or not co-op has an impact on student approaches to study and whether the approaches to study selected, influence academic performance. This study, like others, used a cross-sectional rather than a longitudinal approach to analyze the effects of different year levels on student approaches to study. This, however, may not have been an optimal tactic. With a longitudinal study, changes in student approaches to study and the concomitant changes in academic performance could be tracked throughout a complete study program, for a cohort of co-op students and a cohort of non co-op students. This approach would avoid the necessity of making the assumption that year level cohorts do not differ significantly from each other.

The academic performance of a group of co-op students was compared to the academic performance of a sample of non co-op students. It was found that while the academic results for all students were higher in final year compared to their second year, for non co-op students there was a strong correlation between their final year results and their second year results whereas this correlation was absent for the co-op students. This meant that some factor other than second year results was important in determining the final year results for co-op students. Given that the co-op students and non co-op students with no undergraduate DRWE were matched for their university entrance score, their discipline area of study and their age, the major

difference between the two groups of students was the co-op experience. It was, therefore, concluded that the co-op experience was the factor that led to the improvement in academic results of the final year co-op students. This was found to be the case particularly for female students and for students who had low academic results in second year.

When the results were analyzed in more detail, it was found that the employment pattern of final year students returning from co-op was a factor that could influence academic outcomes. There was no significant correlation between the final year and second year academic results for students who were, post co-op, either not working or who had only taken on part-time DRW. This indicated that the co-op experience had a positive impact on academic performance for these sub-categories of co-op graduates. They also had more time in final year to focus on their academic work compared to those students who worked full-time post co-op. The impact on academic outcomes of the propensity of students to continue working post co-op is an area that, therefore, needs to be further investigated in the future.

The co-op experience was also the differentiating factor between the co-op graduates and the non co-op graduates with no undergraduate DRWE, when graduate employment outcomes were examined. Both cohorts of graduates faced similar labor market conditions when they were seeking employment and all graduates had completed an Economics, Finance or Commerce degree. Any differences in graduate employment outcomes were attributed to co-op and measured in terms of employment rates, job search time, salaries earned, career knowledge, job and salary satisfaction, and turnover rates.

The results showed that 90% of co-op graduates compared to only 19% of non co-op graduates with no undergraduate DRWE had found full-time employment within one month of actively seeking this employment. It took co-op graduates an average of two weeks and non co-op graduates with no undergraduate DRWE three-and-a-half months to find this full-time employment. This result is not surprising given that over 75% of co-op students continued with DRW post co-op, on either a full-time or a part-time basis, and 57% of the co-op graduates returned to their co-op employer for graduate employment. It could, therefore, be argued that the employment advantages for co-op graduates compared to non co-op graduates are influenced by the propensity for co-op students to maintain DRWE post co-op. This may, indeed, be the case indicating that the additional benefit of co-op is that students have the opportunity to continue with DRWE during their final year of study, thereby improving their employability after graduation

The average salary of co-op students, who had completed two academic years and were just commencing their co-op placement, was not significantly different from the average salary of non co-op graduates who had completed their three-year degree, had no undergraduate DRWE and were just commencing their graduate employment. Furthermore, the average salary of the co-op graduates commencing graduate employment was significantly higher than the average salary of the non co-op graduates at the time that they commenced graduate employment. This salary difference reflected the willingness of employers to pay higher starting salaries to graduates with co-op compared to starting salaries of graduates with any other form of undergraduate work experience, including any DRWE. Employers, however, did not distinguish between the co-op year and a year of post graduation DRWE which meant

that the average starting salary for co-op graduates was the same as the average salary for the non co-op graduates with one year post graduation DRWE. This absence of a higher average salary for co-op graduates compared to non co-op graduates can be explained when the academic differences between the two groups of graduates are taken into account.

The co-op graduates in this study had a range of academic results throughout their degree while the non co-op graduates who agreed to participate in this study were all high academic achievers. Many of the major factors that influence employment outcomes, such as labor market conditions, were the same for both groups with the major difference between them being the co-op experience. It could therefore be argued that co-op was the catalyst that enabled the co-op graduates who had poor academic results, particularly prior to their co-op experience, to realize similar employment outcomes to those attained by the non co-op graduates of high academic achievement.

The results of this study also showed that co-op graduates had higher job and salary satisfaction levels than non co-op graduates with no undergraduate DRWE but lower satisfaction levels than non co-op graduates with undergraduate DRWE. The time period over which this study was undertaken was not long enough, however, to determine whether these differences in levels of job and salary satisfaction translated into differences between co-op graduates and non co-op graduates in length of time that they remain with their graduate employer. In future studies, it would also be of interest to explore what factors influence job and salary satisfaction levels and whether these vary between co-op graduates and non co-op graduates.

A greater percentage of non co-op graduates compared to co-op graduates rated their career knowledge as good yet this result was contrary to expectations given that the co-op graduates had the opportunity of a broad exposure to the job market through co-op. The method of data collection involved self-rating by the graduates on their level of career knowledge. This may not have resulted in an accurate reflection of the actual levels of career knowledge that the graduates had. This together with other data collection issues were considered when the design of this study was being developed and framed using a positivist paradigm.

Using a positivist paradigm to frame this study necessitated making the major assumptions that the value of a degree that involved a co-op program was measurable in outcomes that had already occurred and were independent of the researcher. This approach was consistent with the use of empirical measures to estimate the outcomes of a degree with co-op and the use of statistical tests to determine whether these outcomes were significantly different from the outcomes of a similar degree, but one that did not involve co-op. One of the disadvantages associated with the use of a positivist paradigm is the need to treat the graduates as separate from their social context. Efforts were made to control for the academic and labor market environments faced by the students and the graduates of this study. Nonetheless, the way in which the students and graduates interpreted their academic and employment experiences could not be measured empirically and would be better understood by carrying out a phenomenological study.

The objective of this study was to measure the added value of a co-op program but achieving this objective did not lead to a better understanding of why co-op has resulted in these outcomes. This is another area for a future phenomenological study to address. The assumption made in this study that the researcher is objective and independent of what was observed can also be challenged. It is possible that despite efforts to maintain a scientific approach to the study, the researcher's years of experience in, and commitment to, co-op education influenced the outcomes of the research and their interpretation, particularly in relation to the interactions with co-op students and graduates. Using a positivist paradigm did, however, provide a framework for dealing with the large number and the complexity of the variables that interact with co-op.

The research design of this study was developed to ensure the similarity of academic background, year of university entrance, age, academic programs and discipline areas of study for the co-op graduates and the non co-op graduates. These are all factors that could influence academic or employment outcomes. By keeping these factors constant and by using one group of graduates who had undertaken a compulsory co-op program and the other group of graduates who had not, the impact of co-op on outcomes could be identified. The intended research design would also entail both co-op graduates and non co-op graduates having a total of two years DRWE and facing similar labor market conditions. This intended research design, even though it would control some of the confounding variables present in previous studies, could not account for the differences in students that would lead some to select a degree with co-op and the others to select a degree with no co-op. While these differences

can not be measured quantitatively, qualitative research may, in future, provide some insight into this issue.

There were also difficulties in accessing non co-op graduates that resulted in some of the intended research design conditions not being met. While many graduates entered their study program in the specified year (1996) this was not the case for all graduates. Furthermore, the non co-op graduates came from several universities even though all the co-op graduates came from the same university. The main problem with including graduates from several universities, or graduates entering university in different years, is that there may be different entry requirements and different academic standards set over time and by each university. The impact of this problem was reduced, however, given that the academic university entry scores for co-op graduates were very similar to those for non co-op graduates.

Not all participants in this study fulfilled the design requirements of two years of DRWE. Some non co-op graduate had undergraduate DRWE and a total of four years in the labor force. The results for this group were separated from the rest even though the sample size was small. This enabled an analysis to be undertaken of academic and employment outcomes for students and graduates with co-op, for non co-op graduates with no undergraduate DRWE, and for non co-op graduates with some undergraduate DRWE other than co-op e.g. summer placements or traineeships.

The academic and employment outcomes for non co-op graduates with undergraduate DRWE were not as good as those for co-op graduates but better than those for non co-op graduates with no undergraduate DRWE. The implication of these results is that

the co-op experience adds more value to academic and employment outcomes that other forms of DRWE. This may possibly be due to the structured learning experiences that are included in co-op programs but are not a formalized aspect of other DRWE. This is an area that requires further investigation.

The conclusions relating to the comparative academic and employment outcomes for the three groups of graduates are also limited by the small sample size of each group, in particular, the group of 12 non co-op graduates with DRWE. The sample sizes were determined by the number of co-op graduates in the degree program investigated and by the response rate from the non co-op graduates. Despite efforts to obtain responses from a representative sample of non co-op graduates, generally only those with high academic results responded. This response bias has resulted in even more powerful support for the benefits of co-op. Graduates of Economics, Finance or Commerce were targeted for inclusion in this study, however, a study that included a stratified sample of graduates from a range of discipline areas would enable an investigation into whether the results of this study could be generalized to other discipline areas.

The results in this study also indicated that co-op graduates stayed with their co-op company for at least three years. The study only covered three years and a longitudinal study would allow an investigation to be extended into the impact that co-op has on companies' long-term retention rates of graduate recruits. This is an important area for future investigation given that Human Resource Managers have reported that one factor that drives their graduate recruitment strategy is potential of the company retaining the graduate recruit for more than a few years.

Even though the areas for future studies have been identified, this study did substantiate the proposition that co-op had made a significant contribution to the achievement of RMIT's strategic objectives. Evidence was presented that better marketing of co-op to secondary school students could enhance the number of students with high academic achievement who could be attracted to RMIT programs with co-op. Co-op also had a positive impact on student progression and retention rates as well as on the levels of graduate employability. While co-op contributed to the achievement of these strategic objectives it was also associated with a funding shortfall of approximately $1,300 for every Economics and Finance co-op student and a total of $41,600 for the 32 co-op graduates included in this study. This funding shortfall was projected to be $1.04m for the 800 RMIT Business students who currently undertake co-op each year. Further investigation is necessary to determine whether the funding shortfall of $1,300 per student is consistent across all co-op programs. Nonetheless, in order to ensure the long-term financial sustainability of co-op, one option available to RMIT is to seek a share of the significant cost savings experienced by the two other major stakeholders in a co-op program – the Australian Federal Government and employers of co-op graduates.

One of the benefits of co-op to graduate employers was measured in recruitment cost savings of between $1,100 and $3,000 that arose from converting a co-op student into a graduate recruit. This amounted to a saving of between $19,000 and $51,000 for the 17 (or 57%) of Economics and Finance co-op students who returned to their co-op companies as graduate recruits. If the figure of 57% of Economics and Finance co-op students who returned to their co-op companies as graduate recruits is typical for

the 800 RMIT Business co-op graduates, then the total savings to these graduate employers would be between approximately $0.5m and $1.4m.

It was also found that a major benefit of co-op to the Australian Federal Government was a reduction in social welfare payments of approximately $15,000 for every co-op graduate. Only two co-op students received an average of $770 each in Austudy support post co-op. This compared to an average payment of $14,000 per non co-op student paid to ten students during their final year of study and amounted to a total saving for the government, in Austudy payments to students included on this study, of approximately $138,500. The government also paid one co-op graduate approximately $800 in unemployment benefits and five non co-op graduates an average of $1,980 each. This amounted to a total saving to the government of $9,100 in unemployment benefits paid to students included on this study and a total saving in welfare payments of $147,600[1].

In conclusion, while there is a need to extend the research into the added benefits of a cooperative education program to a longitudinal study also covering other discipline areas, there is evidence to show the improved academic and employment outcomes for co-op graduates over non co-op graduates. There is also evidence of significant cost savings that accrue to the Australian Federal Government and to graduate employers as a result of co-op. If these results can be used to transfer resources to the universities that provide these programs then greater efforts can be made to direct the

[1] Calculations were also undertaken to project the saving in total expected welfare payments made by the government for every 800 co-op Business graduates and 800 non co-op Business graduates.

resources in a way that will further enhance the learning and the employment outcomes for co-op graduates.

Attachment 5: CO-OP GRADUATE RESULTS
Attach 5-1: Study History

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS
C1	Mar-96	Nov-99	95.75	1st 2 wks o	16.67	16	co-op - gave break	same deg	4	no	no	5000+
							from study & more	with				
							motivation for 4Y.	co-op				
							RMIT course more					
							personal; I am more					
							office & computer					
							wise with better					
							people skills than non					
							co-op grads					
C2	Mar-96	Jun-00	86.3	yes for	6	21.68	learnt how to learn	same deg	5	Yes	no	5000+
				Y1 & Y2			various ss in conext	with		(Cert)		
							broad o'view in CC &	co-op				
							electives					
							gd u'standing in fin					
							gd u'standing of fin mags					
C3	Mar-96	Nov-99	79.3	no	16.67	19	co-op year	same deg	4	no	no	5000+
							practical learn & know	with				
							from co-op year	co-op				
							the qualification					
C4	Mar-95	Jun-00	80.3	Yes for Y1	5	20	provides a firm basis	same deg	2	no	yes for	5000+
							from which to learn.	with			1 mth	
							wider u'standing & an	co-op				
							approach to ps.					

Study History p2

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS
C5	Mar-96	Jun-00	93.7	no	15.63	16	practical side of ss	same deg	4	no	no	0
							co-op - gives ed that	with				
							is hard to get in c'room	co-op				
							knowledge that you					
							would expect to get					
							from a degree.					
C6	Mar-96	Nov-99	85.35	no	11.47	20	ss were useful	same deg	3.5	no	no	5000+
			95 1Yr				co-op was really good	with				
			Mon				things that you learn	co-op				
			Art/				along the way, eg presn					
			Sci				gp assignments etc					
C7	Mar-96	Nov-00	91	no	11	16	practical	diff deg -	5	no	no	$300
							on-th-job training	FP with				
							applying know at Uni	co-op				
							Finish deg with 3yrs FT					
							work					
C8	Mar-96	Jun-00	84.8	no	12	24	tech/theory know	same deg	1	no	no	0
							dev analytical & ps skills	with				
							tech know not necy applic	co-op				
C9	Mar-96	Nov-00	TAFE	no	10	16.73	EF deg gave me a	diff deg-	2	yes	no	0
							challenge. Finding out	FP with		(M prof		
							diff b'tween EF and Acc	co-op		Acc)		

Study History p3

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

C10	Mar-94	Nov-00	80	Yes for	4.4	12.8	open doors to jobs	diff deg-	2	no	no	5000+
				Y1&2			helps you to think & ps	FP with				
								co-op				

C11	Mar-97	6 units to	TAFE	no	7	2.92	getting this job	same deg	4	no	no	5000+
		go					overall knowledge	with				
							really interested in field	co-op				
							deg provided ex foundn					

C12	Mar-96	Nov-00	78	Yes for	11	22.1	further ed	diff deg	5	no	no	5000+
				Y1&2			interaction with people of	with				
							all ages & cultures	co-op				

C13	Mar-96	Jun-00	83.65	Yes for .5	16	24	gen u'standing of fin	same deg	3	yes	no	0<5000
				of Y1			mkts	with		enrolled in		
				plus Mar-			A lot of SS are applic to	co-op		CFA		
				Ap in FY			what I do now			Oct 00 for		
							deg is rel to other short			3 yrs		
							courses that I've done.					

C14	Mar-96	Jun-00	85	no	10	13.63	employ b'fore grad	same deg	3.5	no	no	0<5000
							time management	with				
							being organised	co-op				
							experience in study area					

C15	Mar-96	Jun-00	79.85	no	23	13.33	my co-op	same deg	2	yes	no	5000+
					(incl study		more specific deg than	with		Master in		
					OS		commerce	co-op		IN B'ness		
							study abroad (Kaist)			Melb U		

Study History p4

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

C16	Mar-97	Nov-99	79.9	yes Y1&2	13	11	my job especially since	same deg	5	no	no	5000+
	start deg						its in a related area	with				

	at Mon						opp to travel	co-op				
C17	Mar-96	Nov-99	90.4	no	12	27.67	having a deg	same deg	5	no	no	0<5000
							taught me discipline &	with				
							that I know nothing	co-op				
							org skills					
							maturity & i'action with					
							people					
C18	Mar-97	6.3 units	72	no	15	11.2	co-op year	same deg	5	no	no	0<5000
		to go	came				the lead up to applying	with co-op				
			from				for jobs was brilliant					
			VUT									
C19	Mar-96	Nov-98	MA	no	16	14	recognition of deg by emp	diff deg-	5	yes	no	0<5000
			Chem				learning the Aus way	combined		CPA		
			deg				change in mindset	with co-op				
							gained confidence by					
							working in co-op					
							logical thinking					
C20	Mar-94	Nov-99	2yrs	yes 5Y	2	12.67	whole life	diff deg-	4	no	no	5000+
	def 1Y to		French	til co-op			able to achieve goals	FP with				
	study Eng		USSR				experience has shown me	co-op				
							that this is the field I					
							want to achieve in					

Study History p5

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS
C21	Mar-96	Nov-00	80.5	no	10	16.67	having co-op is fantastic	same deg	3	no	no	0
								with co-op				
C22	Mar-96	Jun-00	82.5	no	20	15	more specific than comm	diff deg	3.5	yes	no	0<5000

					(incl study		focus on EF	not nec		Masters		
					OS)		not so much a social exp	with co-op		In Bus		
							Kaist			Melb U		
							Co-op					

C23	Mar-96	Jun-99	93.9	no	28.33	25.1	having a broader know	diff deg	3	no	no	0
	start DD						of eco & how it works	not nec				
	in 95						recog that comes with deg	with co-op				
							learnt a lot of computer					
							skills					

C24	Jun-96	Nov-99	89.55	no	19	16.73	being able to work as a	diff deg -	3.5	yes	no	5000+
			95 beg				professional	FP with		short		
			1.5 yrs				being able to do what I'm	co-op		courses		
			DD				currently doing					

C25	Mar-96	Jun-00	81	no	18.67	25	deg business focus very	same deg	4	no	no	0
							beneficial	with co-op				
							need a degree					

C26	Mar-96	Nov-00	VCE	no	10	8	self-confidence	same deg	5	no	no	0<5000
			98/164				analytical skills of study	with co-op				
							altho' diff when in prac					

Study History p6

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

C27	Mar-96	Jun-99	84.1	no	12.86	20.17	co-op	same deg	4	yes	no	5000+
						(incl study	knowing how the WP	with co-op		FT in 01		
						OS)	works & what to expect			GD (Mon)		
							u'standing how you fit in			Dev Stu		

C28	Mar-96	Jun-00	81	no	14	16.89	looks good in WF	diff deg	4	no	no	0<5000

							co-op year helped a lot	with co-op					
							maturing process	(med)					
C29	Mar-97	Nov-00	TAFE	no	14	15.65	knowledge learnt from	diff deg	4	no	no	0<5000	
		took LOA					course	with co-op					
		1 sem 00					co-op year	(comput)					
							research & assts helps						
							a lot with work now						
C30	Mar-96	Nov-99	88.95	no	21.56	21.13	technical knowledge	same deg	5	no	no	0	
							profess assoc - co-op &	with co-op	(diff betw'n				
							contacts		RMIT &				
							practical know of ind		MU)				
							"foot in door"						
C31	Mar-96	Jun-00	80.75	no	9.33	15	na	na	na	no	no	na	
C32	Mar-96	Nov-99	95	no	23	28.67	understanding of course	same deg	4	Yes	no	0<5000	
							co-op experience	with co-op		Master in			
										Info Tech			
										at Mon U			

Attach 5-2 Employment History

	fin deg	after co-op	F/T N seek	start N	co-op salary	post cop salary	start grad salary	curr salary	no of cos (incl co-op)	satis job	satis salary	career know	gender	Age	Co
C1	Nov-99	ret to FT study	0.5 month	2/15/2000	$27,000	na	$37,000	$38,000	1 (+1)	4	4	3	FM	23	IOOF
C2	Jun-00	ret to FT study	0.5 month	1/10/2000	$32,000	na	$35,000	$45,000	2 (+1)	4.5	4	2 to 3	FM	24	Dawson
C3	Nov-99	ret to FT study	5 mths	Feb-00	$27,750	na	$38,500	$40,000	1 (+1)	4	4	2	M	23	Telstra
			while study												(just left)
C4	Jun-00	ret to FT study	2.5 mths	Aug-00	OS	na	$40,000	$40,000	1 (+1)	4	4	3	M	24	Mayne
C5	Jun-00	FT with co-op	0	Jan-99	$25,000	$28,000	$35,000	$44,000	1	3.5	3.5	3	FM	23	ANZ
		employer		after co-op											
C6	Nov-99	ret to FT study	< month	Feb-00	$25,000	na	$29,000	$40,000	2 (+1)	4	3	4.5	FM	25	Dept of
															Infra struc
C7	Nov-00	FT with co-op	0	Jan-99	$28,000	$36,500	$38,500	$43,500	1	5	4	4	FM	23	ANZ
		employer		after co-op											
C8	Jun-00	2.5 days/wk			$25,000	$32,000			1	3	5	3.5	FM	23	UBS
		with co-op								boss					Warburg
		employer								knows &					
		FT with co-op	0	Jul-99			$34,000	$42,000		will					
		employer								respond					
C9	Nov-00	FT with co-op	0	Jan-99	nr	$32,000	$37,000	$61,670	1	2	4	2	FM	30	Aust
		employer		after co-op											Customs

	fin deg	after co-op	F/T N seek	start N	co-op	post cop	start grad	curr	no of cos	satis	satis	career	gender	Age	Co
					salary	salary	salary	salary	(incl co-op)	job	salary	know			
C10	Nov-00	FT with co-op	3 weeks	Jun-98	$27,200	$31,500	$35,000	$38,000	2	4	4	3	M	25	TD
		employer		after co-op											W'house
C11	6 units to	FT with co-op	0	Jan-99	$22,000	$33,000	$38,500	$40,000	1	3	3	4	M	25	OS
		employer		after co-op						Co to OS					Feb-01
C12	Nov-00	PT with co-op	0	Jan-00	$21,000	$26,000	$30,000	$30,000	1	3.5	3	4	FM	23	Nicotra
		employ & PT								going OS					
		study													
C13	Jun-00	.5 day/wk with	1 week		$22,000										
		co-op co til													
		Apr-99 then FT													
		with Macquarie		Apr-99		$35,000									
		with Paribas		Apr-00			$50,000	$60,000	4	4	4	4.5	M	23	BNP
C14	Jun-00	FT with co-op			$27,300										
		employer	0	Jan-99		$32,500	$36,000	$36,000	1	3.5	3	3	M	23	OS
				after co-op				Oct-00		going OS					
C15	Jun-00	2 days/wk with	0	Jan-99	$21,000										
		co-op employer				$31,200									
		plus FT study	went to 5	Dec-99			$40,000								
			days/wk												
			with co-op												
			employer												
		Price W'house		Aug-00				$46,000	2	4	5	3	FM	23	PWC
		Coopers													

Emp History p3

	fin deg	after co-op	F/T N seek	start N	co-op	post cop	start grad	curr	no of cos	satis	satis	career	gender	Age	Co
					salary	salary	salary	salary	(incl co-op)	job	salary	know			

C16	Nov-99	FT with co-op	0	Jan-99	$26,500	$32,000	$49,000	$60,000	2	5	5	3	FM	25	ANZ
		employer													

C17	Nov-99	1day/wk with		Jan-99	$24,000	$24,000		$35,000	2	5	3	3	FM	23	OS
		co-op employer						Oct-00							
		FT Jan-00	0.5 month	Jan-00			$35,000								
		non co-op emp													

C18	6.33 units	FT with co-op	0	Jan-99	$22,000	$30,000	$32,000	$33,000	1	3	2	4	FM	23	Mildara
		employer		after co-op											Blass

C19	Nov-98	FT with co-op	0	Jun-98	$28,000	$32,000	$54,000	$65,000	1	4	3	3	M	35	HP
		employer		after co-op											

C20	Nov-99	3days/wk with	0	Jun-98	$20,000				2 (+1)	5	3	3.5	FM	26	Trust Co
		non co-op co													
		4days/week		Nov-99		$22,000									
		FT		Jan-00			$31,000								
		Trust Co		Aug-00				$35,000							

C21	Nov-00	FT with non	<month	Jan-99	$21,000	$32,000	$38,000	$40,660	1 (+1)	4	3 to 4	3	FM	23	Siemens
		co-op employ		after co-op						will get	raise				
										after deg	fin				
C22	Jun-00	3days/wk with		Jan-99	$24,000				2 (+1)	2	3	5	FM	23	Macq
		non co-op co		after co-op		$34,000									
		FT with Mac	0	Feb-00			$38,000	$40,000							
		Bank													

Emp History p4

	fin deg	after co-op	F/T N seek	start N	co-op	post cop	start grad	curr	no of cos	satis	satis	career	gender	Age	Co
					salary	salary	salary	salary	(incl co-op)	job	salary	know			
C23	Jun-99	Jul-Dec 98 FT	0		$24,700				1	3	3	4	M	25	ANZ

		with co-op co				$33,000				back from					
		Mar-Jul 99 PT								hols now					
		Jul 99 FT		Jul-99			$43,000	$48,000		looking					
					$24,000										
C24	Nov-99	1day/wk with	0			$24,000									
		co-op employ													OS
				Mar-00			$30,000	$40,000	1	3	3	3.5	M	25	Feb-01
C25	Jun-00	FT with co-op	0	Jan-99	$28,000										
		employer		after co-op		$36,500	$42,000	$45,000	1	3	4	4	FM	23	ANZ
C26	Nov-00	4days/wk with	0	Jul-98	$26,000				3	4	3	4	M	25	Wood
		co-op co		after co-op		$28,000									Johnston
		Dasma		Jul-99			$33,000								
		non co-op													
		Wood Johnston		Jun-00				$35,000							
		non co-op													
C27	Jun-99	went on Xchan	6 to 7 wks	Mar-00	$28,600	na	$34,000	$34,000	1 (+1)	3	4	3.5	M	23	FT study
		after co-op						(Nov 00)							Mar-01
		then to FT stud													
C28	Jun-00	FT with co-op		Jan-99	$28,200	$40,000			2	1	1.5	3	M	23	Could
		employer		after co-op						needs to					not be
		for 1 yr ret FT								develop					contact
		study 1 sem 00								in job					Feb-01
															(moved
		FT with non	1 week	Aug-00			$34,000	$34,000							on)
		co-op employer						(Nov-00)							

Emp History p5

	fin deg	after co-op	F/T N seek	start N	co-op	post cop	start grad	curr	no of cos	satis	satis	career	gender	Age	Co
					salary	salary	salary	salary	(incl co-op)	job	salary	know			
C29	Nov-00	FT with co-op	0	Jan-99	$25,000	$27,000	$32,000	$35,000	1	3	2	4	M	29	CBA

		employer		after co-op						wait to fin					
										course					
C30	Nov-99	ret to FT RMIT	0	End Jan-00	$25,900	na	$41,000	$46,000	1(+1)	4	4	3	M	24	Westpac
		(PT non deg													
		work $10/hr)													
C31	Nov-99	4days/wk with	went OS	na	nr	$37,500	na	na	1	na	na	na	M	23	OS
		co-op employ	Jan-00												Jan-00
		PT study													
C32	Nov-99	ret to FT RMIT	na	na	na	na	na	na	na	na	na	na	M	25	FT study

Attachment 6: NON CO-OP GRADUATE RESULTS
Attach 6-1 Study History

Uni	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS
nc1												
Mon- Clay	Mar-94	Nov-99	133/164	2.5 years	2.86	6.29	Never a lesser person for	same deg	1	no	no	5000+
B.Ec							having been educated.	with				
							Taught me social skills.	co-op				
							Provided me with fab					
							network of friends &					
							contacts					
nc2												
Mon- Clay	Mar-97	Nov-98	137/164	No	14.86	18	Need deg to get a job	same deg	1	Sec Inst	no	5000+
IN trade							Looks good to have 2 deg	with		course in		
								co-op		2001		

nc3	Mar-96	Nov-99	83.7	no	24	24	A general knowledge of	same deg	3	no	no	0
Mon-Caul							the Australian and	with				
B & F							International financial	co-op				
							system					

nc4	Mar-96	Jun-99	82.15	Yes	13	na	Financial mkts knowledge	same deg	1	yes	no	5000+
Mon-Caul							Education helps to	with				
B&F							move up corporate	co-op				
							ladder					

Study History p2

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS
nc5	Mar-96	Jun-99	83.05	no	5	14.5	Job that you can actually	same deg	1	no	no	5000+
Mon-Caul							move up in.	with		but plan to		
B&F								co-op		do SI		
										course		

nc6 DD	Mar-96	Jun-00	97.7	yes	20.6	16	Piece of paper	diff deg	1	no	no	5000+
Mon-Caul							Very practical	without				
B&F							Very much a MM deg	co-op				
Law												

nc7 DD	Mar-95	Nov-00	80.85	no	11	16	Gained valuable know	same deg	4	no	no	$0
Mon-Caul							about real bus.	with co-op				
B&F							Greater fin know.					
Acc							Job opportunities					
							Helps prepare for WF					

nc8 DD	Mar-95	Nov-98	93.25	yes	nr	nr	Ability to learn	same deg	3	no	no	5000+
Mon-Caul				1995-1998			Broad know of world,	with				
B&F							cultures, gov, bus prac.	co-op				
IN Trade							Getting a good job					
							straight out of Uni					

nc9	Mar-97	Nov-99	92.2	no	22	26	General bus knowledge	same deg	2	no	no	5000+
Mon-Caul							Interesting subjets	with				
B&F							Good personal develop	co-op				

Study **History p3**

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

nc10 HONS	Mar-95	Nov-99	146/164	Yes, 95-99	19	30	Exposure to stimulating	Indifferent	2	no	no	5000+
Mon-Caul							Uni environment					
B&F(Hons)							Ability to apply for prof					
							roles in fin makts					
							Ability to think independ					

nc11 we	Mar-94	Nov-97	app 86	no	17	18	Problem solving	same deg	3	no	no	$0
Mon-Caul							Written & verbal commun	with				
B&F							Broad u'standing of b'ness	co-op				
							Gd credit & legal ground					

nc12	Mar-97	Nov-99	91	no	19	23	Uni life shaped way I think	diff deg	3	no	no	$0
Mon-Caul							organise & make reports	with				
B&F							Communication skills	co-op				

nc13	Mar-94	Nov-96	nr	yes	15	12	Ability to learn new tasks	same deg	4	yes	no	$0
UWSyd				94-96			& pick up training in a	with				
Tourism							work environment more	co-op				
							quickly					
							Ability to learn quicker					

nc14 DD	Mar-94	Nov-98	152	no	26	26.7	knowledge	same deg	1	no	no	$0
Deakin								without				
Commerce								co-op				
Law												

Study **History p4**

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

nc15 we	Mar-95	Nov-98	94.5	no	18	30	Intro to basic commerce	same deg	1	yes	no	5000+
Melb							Benefits from work exp	with				

Commerce								co-op				

nc16 we	Mar-95	Nov-99	74.3	no	20	20.6	Employt/career	same deg	5	yes	no	5000+
VUT								with				
Acc								co-op				

nc17	Mar-96	Nov-98	95.6	no	20	20	Got a job	same deg	3	yes	no	$0
Melb								without				
Commerce								co-op				

nc18 DD	Mar-93	Nov-98	156/164	no	20	17	Broad options in later	same deg	1	yes	no	5000+
Deakin							career choice	without				
Commerce								co-op				
Law												

nc19 we	Mar-96	Nov-98	69.75	Yes,	22	25	Computer skills	same deg	nr	Yes	no	5000+
Deakin				96 & 97			Technical know - com	without				
Commerce							& accounting	co-op				
							General business know					

nc20 DD we	Mar-95	Nov-98	90	no	21.4	20.4	A taste of a various range	same deg	3	Yes	no	5000+
Mon-Caul							of subjects that gave me	without				
B&F							a wide skill base.	co-op				
Arts												

Study History p5

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

nc21	Mar-96	Nov-98	Mature	Yes	30	29	Not only learning the	same deg	3	no	no	0
VUT			Age	96,97,98			theory of bness but the	with co-op				
B.Bus							ability to u'stand its					
							importance, relevance &					

							implementation w'in the					
							organisation					

nc22	Mar-95	Jun-98	83	no	10	10	A small insight into	same deg	2	yes	no	0
Mon - Clay							various business	with co-op				
Commerce							disciplines					

nc23 Ddwe	Mar-95	Nov-98	48	yes	23	31	Technical & theoretical	same deg	3	yes	yes	5000+
La Trobe				all years			knowledge	with co-op			6 months	
B.Comput												
GD in MM												

nc24	Mar-94	Nov-97	121/164	yes	18	25	Building up my know	same deg	2	no	yes	5000+
VUT				all years			Opening door of opportun	with co-op			2 months	
B.Bus							Giving me the chance to					
Computing							find the job always wanted					

nc25	Mar-95	Nov-97	88	no	13	19	research skills	same deg	1	no	yes	5000+
Mon								with co-op			1 month	
B.Com-MM												

Study **History p6**

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

nc26 Ddwe	Mar-95	Nov-98	85.6	yes	17.6	7.2	Pratical application	same deg	1	yes	no	5000+
Mon				95,96			Wide variety of subjects	with co-op				
B.Arts							not just the majors.					
B.Bus(Acc)												

nc27	Aug-94	May-98	nr	no - full	22.7	24	didn't focus on just 1 area	same deg	1	no	yes	$0

USA				S'ship			of b'ness. 4 yrs gave xtra	without			4 mths	
BBA							time.	co-op				

nc28	Mar-95	Nov-98	nr	no	10.7	21.3	A deep understanding	same deg	1	yes	yes	$0
Aukland				(gov loan)			of the financial systems &	without			1 week	
Commerce				NZ $29K			human behaviour.	co-op				
							How to learn					

nc29 we	Mar-94	Nov-98	125/164	no	9.8	12	The knowledge gained	same deg	1	no	no	5000+
RMIT							wasn't applicable to real	with co-op				
BBBA							world. It opened the door					
							to opportunities. My non-					
							ac skills & exp helped.					

nc30	Mar-94	Nov-98	72	no	20	22.9	Commitment	diff deg	2	Yes	yes	5000+
Mon							A broad u'standing	with co-op			5 months	
M'ment							of various streams					

Study **History p7**

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

nc31 we	Mar-92	Nov-95	97.1	no	9.8	14.2	Being self-disciplined	same deg	1	yes	no	5000+
U of NSW							The ability to work	with co-op				
Commerce							unsupervised					

nc32 DD	Feb-95	Nov-98	72.9	No	17.8	22	Completings Arts & Com	same deg	3	no	no	5000+
Deakin							led to better u'standing	with co-op				
Commerce							of b'ness ss. Degs prep					

Arts							me for culture, environt,					
							expectations, dd,service					
							levels req at the WP					

nc33 Ddwe	Mar-94	Nov-98	130	yes	26.7	24	Wide exposure to diff	same deg	1	no	yes	5000+
LaTrobe				1st 3 years			subject areas	with co-op			4 weeks	
Bbus (Acc)				last half			Good support & advice					
Bcomput				year			Autonomous develop &					
							learning					

nc34 we	Mar-95	Nov-98	129/164	no	23	25	Theory with some links to	same deg	1	no	no	5000+
RMIT							business.	with co-op				
BBBA							Team work					

nc35 Ddwe	Mar-94	Nov-98	140/164	no	22	24	capacity to think logically	same deg	4	no	no	5000+
Mon							research skills	with co-op				
BB-IN Trade												
Arts -												
French												

Study History p8

	deg start	deg finish	TER	AUS	res 2Y	res FY	maj ben	hindsight	co-op imp	curr study	UnN Ben	HECS

nc36 DD	Mar-93	Nov-98	162/164	yes	22.7	19.2	Analysis and	same deg	1	No	no	5000+
U of Melb							communication skills	without				
Commerce								co-op				
Arts												

nc37 Ddwe	Mar-94	Nov-96	nr	No	15.1	16	Group work	same deg	1.5	yes	no	5000+
nc37							Research experience	with co-op				
BA Jap							Analysing experience					
BBus							me for culture, environt,					
MPA												

nc38 DD	Mar-96	Nov-99	80.3	yes	22	19	It's a good combination	same deg	3	no	no	$0
Mon- Caul				1st 2 years			of degrees and it allows	with co-op				
BBus (Acc)				96 & 97			me to enter into either					
B & F							career easily					

nc39	Mar-96	Nov-98	84.1	no	19	24	Àbility to leave Uni with a	diff deg	1	yes	no	0<5000
Deakin							deg relevant to what I	without				
Commerce							would actually be doing	co-op				

Attach 6-2 Employment History

	fin deg	deg rel work	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career know	gender	Age	co
nc1	Nov-99	no	yes - all yrs	landed in lap	Feb-00	$25,000	$29,000	1	1	1	2.5	M	25	Aust Hotel
nc2	Nov-98	no	yes - all yrs	arranged	1/25/1999	$34,100	$44,000	1	2	4	2	M	25	NAB
	(2 deg)			before deg										
				fin										
nc3	Nov-99	no	yes	6months	Jan-00	$42,000	$60,000	1	3	4	4	M	22	Deutsche
			all years	before grad										
nc4	Jun-99	no	yes, y2&3	6months	Jan-00	$30,000	$36,500	2	2	2	3	FM	22	NAB
				after deg										
nc5	Jun-99	no	yes	3-4 months	Jul-99	$27,500	$30,300	1	3	2 to 3	4	M	23	NAB
			all years	2 wks>deg			32,5@1/1/01							
nc6	Jun-00	no	contractor	started own	Jun-00	nr	$25,000	own co	3	1	4	M	24	not for pub
	(2 deg)			co				PT contract						
nc7	Nov-00	no	yes	1-2 months	Feb-00	$27,500	$40,000	1	4	4	4	M	23	Lion
	(2 deg)		all years	after deg										Nathan
nc8	Nov-98	no	yes	2 months	Jul-00	$44,600	$44,600	1	3	4	3	FM	23	Accenture
	(for B&F)		all years	before deg										(Anderson
	(2 deg)													Consult)

	fin deg	deg rel	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career	gender	Age	co
		work									know			
nc9	Nov-99	no	yes	4 months	Dec-99	$36,259	$36,259	1	2	4	3	M	24	NAB
			all years	before deg										
nc10	Nov-99	no	yes	not specified	Jan-00	$34,000	$50,000	2	5	4	4	M	26	NAB
			all years	before deg										
nc11	Nov-97	yes	yes	straight away	Jan-97	$28,000	$60,000	1	4	4	3	FM	25	ANZ
		ANZ	Yrs 1,2,3	before deg										
		97												
nc12	Nov-99	no	no	1year	Sep-00	$28,000	$28,000	1	4	2	4	FM	23	nr
				after deg										
nc13	Nov-96	no	yes	2 months	Feb-97	$33,000	$56,100	3	5	4	4	FM	25	ANZ
			all years	after deg										
nc14	Nov-98	no	Yes	4 months	Apr-99	$32,000	$55,000	1	4	5	4	FM	25	nr
			all years	before deg										

Empl History p3

	fin deg	deg rel	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career	gender	Age	co
		work									know			

nc15	Nov-98	Yes	No	0	Mar-95	$20,000	$63,000	1	5	4	4	M	23	PWC
		t'ship			After deg	$34,000								
nc16	Nov-99	Yes	Yes	2 months	1/97-1/99	$20,000	$39,000	1	3	2	4	FM	24	PWC
		AAT	1st & 2nd yr	before deg				(+1)						
		97-99			Feb-99	$31,000								
		30hrs/wk												
nc17	Nov-98	no	no	1 month	Jan-99	$29,000	$39,000	1	1	2	4	M	22	PWC
				Before deg										
nc18	Nov-98	no	yes	2 months	Feb-99	$32,000	$55,000	1	3	3	3	FM	26	PWC
			all years	Before deg										
nc19	Nov-98	Yes	yes	2 months	deg wk	$100/day	$38,000	1	4	4	3	FM	23	PWC
		David	all three yrs	before deg	6mths @1D			(+1)						
		Baum-												
		gartner			Feb-99	$28,500								
		6mths												
nc20	Nov-98	yes	yes	2-3 months	deg wk	$5,000/yr	$45,000	1	5	4	4	FM	24	PWC
		Pioneer	all years	Before deg				(+1)						
		10hrs/wk			after deg	$30,500								
		4yrs												

Empl History p4

	fin deg	deg rel	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career	gender	Age	co
		work									know			
nc21	Nov-98	no	yes	1 month	Jan-99	$29,500	$75,000	1	5	5	5	Male	29	PWC

			all years	before deg										
nc22	Jun-98	no	yes	1 year	Jul-98	$27,570	$48,150	1	3	3	4	FM	24	PWC
			all years	before deg										
nc23	Nov-99	yes	yes	first	deg wk			1	2	3	2	FM	23	PWC
			Guerlain	application	Multi media	$200/wk								
				before deg	2 summers									
					Hitachi	$300/wk								
					6 months									
					Powercor	$300/wk								
					6 months									
					after deg	$31,500	$42,000							
					Nov-99									
nc24	Nov-97	no	no	2 months	19/798	$21,000	$35,560	2	4	4	4	FM	27	ANZ
				after deg										
nc25	Nov-97	no	yes	3 months	Jul-98	$27,000	$39,000	3	4	2	2	FM	24	ANZ
			95,96,97	after deg										

Empl History p5

	fin deg	deg rel	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career	gender	Age	co
		work									know			
nc26	Nov-98	yes	Yes	3 weeks	Feb-99	nr	nr	nr	nr	nr	nr	FM	nr	nr
		Bunu-	final year	grad recruit										

		rong		before deg										
		Mem Prk												
		1996 97?												
		20 h/w												
		$220/wk												
nc27	May-98	no	no	4 months	Mar-98	$29,000	$60,000	2	5	5	4	M	24	ANZ
				after deg										
nc28	Nov-98	no	yes	3 months	Feb-99	NZ$29,859	$35,656	1	2	3	4	M	24	ANZ
			95,96,97	after deg										
nc29	Nov-98	yes	yes	4 months	Mar-99	$30,000	$55,000	1	4	5	4	M	25	ANZ
		Cutco	yrs 1-4	after deg										
		6mths												
		50h/w												
		$50K/yr												
nc30	Nov-98	no	yes	6 months	Apr-99	$31,000	$36,000	2	3	2	3	M	24	ANZ
			yrs 1-4	after deg										

Empl History p6

	fin deg	deg rel	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career	gender	Age	co
		work									know			
nc31	Nov-95	yes	Yes	1 month	Jan-97	$35,000	$50,000	3	4	2	4	M	27	ANZ
		CBA	years 1-3	after deg										
		3 months												
		FT												
		$30000pa												

		(2ce)												
nc32	Nov-98	no	yes	8 months	Dec-98	$28,000	$31,500	2	2	1	3	M	24	ANZ
			95-98	after deg										
nc33	Nov-98	yes	yes	last 2 months	Aug-99	$32,000	$37,585	2	3	2	3	M	25	ANZ
			96,97,98	of deg										
		2 mths				$27,000pr								
		5 mths				IBL								
		5 mths				IBL								
		10 weeks				$28,000pr								
nc34	Nov-98	yes	yes	short time	Feb-99	$32,000	$56,100	1	4.5	4.5	4.5	FM	26	ANZ
		cba	yr 1	before deg										
		3 yrs												
		20h/wk												
		$30K pr												

Empl History p7

	fin deg	deg rel	non deg work	F/T N seek	start N	beg salary	curr salary	no of cos	satis-job	satis-sal	career	gender	Age	co
		work									know			
nc35	Jun-98	yes	yes	short time	Feb-99	$33,500	$42,500	1	4	4	3.5	FM	25	ANZ
		2.5 months	2 yrs 94-96	before deg										
		Flying with	2 yrs @law	2 yrs @law		deg wk								
		Mkters	96-98			$31,200pr								
nc36	Nov-98	no	yes	2 weeks	Aug-98	$31,000	$56,000	2	4	4	3	FM	25	ANZ
			all years	before deg										

nc37	Nov-96	yes	no	Grad recruit	Jan-97	$30,000	$41,248	2	5	5	3.5	FM	27	ANZ
		Discovery		before deg		1st job								
		Bay Devel												
		94-98				$33,000								
						ANZ								
		$30K				Jan-99								

nc38	Nov-99	no	yes	2 years	Dec-99	$31,000	$37,000	2	4	2	2	FM	24	nr
			all years	before deg										

nc39	Nov-98	no	yes	2 months	Feb-99	$29,500	$39,000	1	3	2	4	M	23	PWC
			97,98	before deg										

Attachment 7 **APPROACHES TO STUDY INVENTORY**
Attach 7-1 **Meaning Orientation (MO)**

ECONOMICS & FINANCE

Year	Comp learn	Year	Deep app	Year	Rel ideas	Year	Evid & log	Year	MO
2	3.00	2	3.75	2	4.25	2	3.75	2	14.75
2	3.25	2	3.67	2	4.00	2	3.75	2	14.67
2	3.00	2	3.75	2	3.75	2	4.00	2	14.50
2	4.00	2	3.50	2	2.50	2	2.75	2	12.75
2	4.50	2	4.50	2	4.00	2	4.50	2	17.50
2	3.25	2	4.33	2	4.00	2	4.00	2	15.58
2	2.50	2	4.00	2	4.50	2	4.00	2	15.00
2	2.00	2	2.50	2	3.00	2	2.00	2	9.50
2	2.25	2	3.50	2	4.00	2	2.25	2	12.00
2	3.50	2	4.00	2	3.75	2	4.00	2	15.25
2	2.00	2	3.25	2	3.75	2	3.25	2	12.25
2	3.25	2	3.75	2	3.25	2	3.50	2	13.75
2	2.25	2	4.00	2	3.50	2	3.50	2	13.25
2	3.50	2	4.25	2	4.50	2	3.00	2	15.25
2	3.50	2	2.75	2	4.25	2	3.50	2	14.00
2	2.75	2	2.50	2	3.25	2	2.75	2	11.25
2	3.25	2	3.75	2	4.50	2	4.00	2	15.50
2	3.67	2	3.75	2	4.25	2	3.75	2	15.42
2	3.75	2	3.50	2	3.50	2	2.67	2	13.42
2	2.75	2	3.75	2	3.75	2	3.50	2	13.75
2	3.00	2	4.00	2	4.50	2	3.75	2	15.25
2	3.25	2	3.50	2	3.50	2	3.00	2	13.25
2	3.00	2	3.25	2	3.75	2	3.25	2	13.25
2	3.25	2	3.25	2	4.00	2	4.00	2	14.50
2	3.25	2	4.00	2	4.00	2	3.50	2	14.75
2	3.25	2	3.75	2	4.00	2	3.50	2	14.50
2	2.25	2	3.00	2	4.00	2	2.75	2	12.00
2	2.25	2	2.75	2	3.00	2	2.25	2	10.25
2	3.50	2	4.00	2	4.50	2	3.00	2	15.00
2	3.75	2	3.25	2	2.75	2	3.00	2	12.75
2	3.25	2	3.00	2	4.00	2	3.25	2	13.50
2	2.50	2	4.00	2	3.75	2	4.00	2	14.25
2	3.00	2	2.75	2	3.75	2	3.25	2	12.75
2	3.50	2	4.00	2	4.50	2	4.00	2	16.00
2	2.75	2	3.75	2	3.25	2	3.00	2	12.75
2	1.25	2	2.50	2	2.25	2	2.75	2	8.75
2	3.25	2	3.25	2	4.00	2	4.25	2	14.75
2	3.00	2	3.25	2	3.50	2	3.50	2	13.25
2	1.75	2	4.00	2	3.00	2	4.25	2	13.00
2	4.50	2	4.25	2	4.25	2	3.75	2	16.75
2	3.50	2	3.25	2	3.75	2	3.00	2	13.50
2	3.50	2	3.75	2	4.00	2	4.00	2	15.25
2	3.25	2	4.25	2	4.25	2	4.00	2	15.75
2	4.00	2	4.00	2	4.75	2	4.25	2	17.00
2	2.00	2	3.00	2	3.00	2	3.25	2	11.25
2	2.00	2	2.50	2	2.50	2	2.50	2	9.50
2	3.25	2	3.75	2	4.00	2	3.75	2	14.75
Year	**Comp learn**	**Year**	**Deep app**	**Year**	**Rel ideas**	**Year**	**Evid & log**	**Year**	**MO**
2	3.25	2	3.75	2	3.75	2	3.50	2	14.25
3	4.25	3	3.50	3	4.25	3	4.00	3	16.00

3	2.75	3	3.50	3	4.50	3	3.25	3	14.00
3	3.50	3	3.25	3	4.00	3	3.75	3	14.50
3	2.75	3	3.25	3	3.33	3	3.50	3	12.83
3	2.50	3	3.50	3	2.75	3	2.75	3	11.50
3	3.75	3	4.25	3	4.75	3	3.75	3	16.50
3	3.25	3	3.25	3	3.75	3	2.75	3	13.00
3	2.75	3	3.75	3	3.50	3	4.00	3	14.00
3	2.00	3	3.25	3	4.00	3	3.50	3	12.75
3	2.75	3	3.75	3	3.25	3	2.50	3	12.25
3	3.25	3	4.00	3	3.75	3	3.00	3	14.00
3	2.25	3	2.75	3	3.00	3	2.25	3	10.25
3	4.75	3	2.75	3	4.00	3	4.00	3	15.50
3	3.75	3	3.50	3	3.50	3	4.00	3	14.75
3	2.67	3	4.00	3	4.00	3	3.75	3	14.42
3	1.75	3	3.50	3	3.50	3	3.25	3	12.00
3	3.50	3	3.50	3	3.50	3	3.25	3	13.75
4	3.00	4	3.75	4	4.00	4	3.50	4	14.25
4	3.33	4	3.25	4	3.75	4	3.25	4	13.58
4	3.25	4	3.75	4	3.75	4	3.00	4	13.75
4	2.00	4	3.50	4	3.50	4	3.00	4	12.00
4	2.50	4	3.50	4	2.75	4	3.00	4	11.75
4	3.00	4	4.00	4	4.50	4	3.50	4	15.00
4	3.00	4	3.25	4	3.25	4	3.00	4	12.50
4	3.25	4	4.50	4	4.00	4	3.25	4	15.00
4	3.00	4	3.50	4	3.75	4	3.75	4	14.00
4	2.75	4	3.75	4	3.75	4	4.25	4	14.50
4	4.00	4	3.50	4	4.25	4	3.75	4	15.50
4	2.75	4	2.50	4	3.50	4	2.75	4	11.50
4	3.25	4	3.75	4	3.33	4	2.67	4	13.00
4	2.67	4	2.75	4	3.33	4	3.25	4	12.00
4	3.25	4	3.50	4	4.50	4	3.25	4	14.50
4	3.25	4	3.25	4	3.75	4	3.75	4	14.00
4	3.25	4	4.00	4	4.25	4	3.75	4	15.25
4	2.25	4	3.75	4	4.50	4	3.50	4	14.00
4	2.75	4	4.33	4	3.00	4	3.75	4	13.83
4	2.25	4	3.75	4	3.25	4	2.50	4	11.75
4	3.75	4	3.75	4	4.00	4	4.00	4	15.50
4	4.00	4	3.25	4	4.25	4	3.75	4	15.25
4	3.50	4	3.50	4	3.75	4	3.50	4	14.25
4	3.25	4	3.75	4	3.50	4	3.75	4	14.25
4	3.25	4	3.75	4	4.25	4	3.25	4	14.50
4	2.75	4	4.25	4	3.75	4	3.25	4	14.00
4	3.25	4	3.75	4	3.50	4	2.50	4	13.00
4	3.00	4	3.00	4	2.75	4	3.00	4	11.75
4	3.25	4	3.75	4	3.75	4	3.75	4	14.50
4	3.25	4	4.25	4	4.00	4	3.00	4	14.50
4	2.25	4	4.00	4	3.75	4	4.25	4	14.25
4	4.00	4	3.50	4	4.00	4	3.50	4	15.00
4	3.75	4	3.00	4	4.00	4	3.00	4	13.75
4	3.00	4	3.50	4	3.50	4	3.00	4	13.00
Year	**Comp learn**	**Year**	**Deep app**	**Year**	**Rel ideas**	**Year**	**Evid & log**	**Year**	**MO**
4	3.50	4	3.50	4	3.25	4	3.00	4	13.25
4	2.75	4	3.75	4	3.00	4	4.00	4	13.50
4	2.75	4	3.50	4	4.00	4	2.50	4	12.75
4	2.25	4	3.50	4	3.75	4	3.00	4	12.50
4	3.50	4	3.00	4	2.75	4	2.75	4	12.00

4	3.50	4	4.00	4	4.50	4	3.75	4	15.75
4	3.75	4	3.50	4	4.00	4	3.75	4	15.00
4	4.25	4	3.75	4	4.25	4	3.75	4	16.00

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*'ariance*
Year	107	315	2.9439252	0.85
CL	107	330	3.0802181	0.41

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	0.99380192	1	0.9938019	1.58	0.2100922	3.89
Within	133.315291	212	0.6288457			
Total	134.309093	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*'ariance*
Year	107	315	2.9439252	0.85
Deep	107	381	3.5615265	0.22

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	20.4065745	1	20.406575	38.5	2.884E-09	3.89
Within	112.487669	212	0.5306022			
Total	132.894243	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*'ariance*
Year	107	315	2.9439252	0.85
Relate	107	401	3.7453271	0.28

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	34.3601051	1	34.360105	61	2.643E-13	3.89
Within	119.494548	212	0.5636535			
Total	153.854653	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*'ariance*
Year	107	315	2.9439252	0.85
Logic	107	362	3.3862928	0.29

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*

Betwee	10.4693666	1	10.469367	18.5	2.655E-05	3.89
Within	120.294003	212	0.5674245			
Total	130.76337	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*'ariance*
Year	107	315	2.9439252	0.85
MO	107	1474	13.773364	2.61

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	6274.30637	1	6274.3064	3634	2.17E-135	3.89
Within	366.077362	212	1.72678			
Total	6640.38373	213				

Attachment 7 **APPROACHES TO STUDY INVENTORY**
Attach 7-2 **Reproducing Orientation (RO)**

ECONOMICS & FINANCE

Year	Fear fail	Year	Rel detail	Year	Surface	Year	Syll bound	Year	RO
2	3.00	2	2.50	2	4.17	2	4.33	2	14.00
2	3.33	2	3.25	2	4.17	2	3.33	2	14.08
2	2.33	2	3.50	2	3.50	2	4.33	2	13.67
2	2.67	2	3.25	2	3.00	2	2.00	2	10.92
2	2.00	2	2.50	2	2.67	2	3.00	2	10.17
2	1.67	2	2.75	2	3.00	2	4.00	2	11.42
2	3.00	2	3.00	2	1.80	2	3.00	2	10.80
2	2.67	2	3.25	2	4.17	2	4.00	2	14.08
2	3.00	2	2.50	2	2.50	2	4.00	2	12.00
2	2.67	2	3.25	2	3.67	2	3.67	2	13.25
2	4.33	2	3.75	2	3.17	2	3.67	2	14.92
2	3.67	2	3.00	2	2.83	2	4.00	2	13.50
2	4.33	2	3.50	2	4.00	2	4.33	2	16.17
2	3.00	2	4.00	2	3.83	2	4.00	2	14.83
2	2.67	2	3.50	2	3.33	2	3.67	2	13.17
2	4.33	2	3.00	2	3.67	2	4.33	2	15.33
2	4.00	2	4.25	2	4.83	2	3.33	2	16.42
2	1.67	2	3.00	2	3.17	2	2.67	2	10.50
2	2.33	2	3.50	2	4.00	2	4.50	2	14.33
2	2.33	2	3.75	2	3.17	2	3.33	2	12.58
2	3.00	2	3.25	2	3.00	2	4.00	2	13.25
2	4.33	2	3.75	2	3.50	2	4.33	2	15.92
2	4.33	2	4.00	2	3.33	2	4.67	2	16.33
2	3.33	2	3.25	2	2.33	2	3.67	2	12.58
2	4.33	2	4.00	2	3.67	2	3.67	2	15.67
2	4.33	2	3.75	2	2.50	2	4.67	2	15.25
2	4.00	2	4.00	2	3.83	2	4.67	2	16.50
2	2.67	2	3.00	2	3.50	2	4.00	2	13.17
2	2.67	2	3.00	2	2.67	2	2.67	2	11.00
2	3.67	2	3.25	2	3.17	2	4.33	2	14.42
2	3.00	2	2.50	2	2.67	2	3.33	2	11.50
2	2.67	2	3.00	2	2.67	2	4.00	2	12.33
2	2.33	2	3.00	2	2.83	2	4.00	2	12.17
2	3.50	2	4.00	2	3.50	2	5.00	2	16.00
2	2.00	2	2.75	2	3.83	2	4.67	2	13.25
2	2.67	2	3.00	2	3.83	2	4.67	2	14.17
2	2.67	2	2.50	2	4.33	2	4.00	2	13.50
2	4.33	2	1.75	2	3.83	2	4.33	2	14.25
2	3.67	2	3.50	2	3.83	2	3.33	2	14.33
2	2.67	2	4.00	2	3.00	2	3.33	2	13.00
2	2.00	2	3.00	2	4.00	2	3.33	2	12.33
2	1.33	2	2.00	2	2.17	2	2.67	2	8.17
2	1.67	2	2.00	2	3.00	2	2.67	2	9.33
2	2.67	2	3.25	2	3.00	2	2.67	2	11.58
2	2.67	2	2.25	2	3.67	2	4.33	2	12.92
2	3.33	2	3.00	2	3.83	2	4.67	2	14.83
2	3.67	2	2.75	2	3.50	2	4.33	2	14.25
Year	**Fear fail**	**Year**	**Rel detail**	**Year**	**Surface**	**Year**	**Syll bound**	**Year**	**RO**
2	4.00	2	2.75	2	3.33	2	3.67	2	13.75
3	3.00	3	3.00	3	2.83	3	3.33	3	12.17

3	4.00	3	3.75	3	3.33	3	3.67	3	14.75
3	2.33	3	3.75	3	3.33	3	4.50	3	13.92
3	3.33	3	2.75	3	3.00	3	3.33	3	12.42
3	3.33	3	2.25	3	4.17	3	4.00	3	13.75
3	3.00	3	3.25	3	3.00	3	4.00	3	13.25
3	2.67	3	3.50	3	3.33	3	4.00	3	13.50
3	2.33	3	2.75	3	3.17	3	4.67	3	12.92
3	2.00	3	3.00	3	4.17	3	3.67	3	12.83
3	3.00	3	3.75	3	3.67	3	4.67	3	15.08
3	2.33	3	2.50	3	3.83	3	3.33	3	12.00
3	2.33	3	2.75	3	3.00	3	4.67	3	12.75
3	2.50	3	2.75	3	2.33	3	3.33	3	10.92
3	3.67	3	2.50	3	3.83	3	3.33	3	13.33
3	3.00	3	3.00	3	2.80	3	3.00	3	11.80
3	3.00	3	2.50	3	4.00	3	3.67	3	13.17
3	2.00	3	2.75	3	3.33	3	4.33	3	12.42
4	4.33	4	3.25	4	3.33	4	3.67	4	14.58
4	3.33	4	2.75	4	2.83	4	3.33	4	12.25
4	3.33	4	3.75	4	3.50	4	4.33	4	14.92
4	2.67	4	3.00	4	3.00	4	4.33	4	13.00
4	1.33	4	3.50	4	4.17	4	4.67	4	13.67
4	4.33	4	4.25	4	3.83	4	3.67	4	16.08
4	2.67	4	2.50	4	2.00	4	2.67	4	9.83
4	2.67	4	3.00	4	2.83	4	3.67	4	12.17
4	4.67	4	3.50	4	3.83	4	4.00	4	16.00
4	1.67	4	3.50	4	3.17	4	3.67	4	12.00
4	2.33	4	3.25	4	2.67	4	4.00	4	12.25
4	3.33	4	3.75	4	3.83	4	4.00	4	14.92
4	2.67	4	3.25	4	3.17	4	3.00	4	12.08
4	2.00	4	3.75	4	3.83	4	4.00	4	13.58
4	3.67	4	4.50	4	4.50	4	4.67	4	17.33
4	3.67	4	3.50	4	3.67	4	4.67	4	15.50
4	3.00	4	3.00	4	4.33	4	4.33	4	14.67
4	4.00	4	2.00	4	2.67	4	3.67	4	12.33
4	1.67	4	2.50	4	2.67	4	2.67	4	9.50
4	4.33	4	2.75	4	4.00	4	4.67	4	15.75
4	3.33	4	4.00	4	3.50	4	4.00	4	14.83
4	4.33	4	4.50	4	4.33	4	4.00	4	17.17
4	3.33	4	3.25	4	3.67	4	4.67	4	14.92
4	4.00	4	3.25	4	3.83	4	4.00	4	15.08
4	4.33	4	4.00	4	3.33	4	4.33	4	16.00
4	2.67	4	2.50	4	3.00	4	4.00	4	12.17
4	3.00	4	2.75	4	3.33	4	4.33	4	13.42
4	3.33	4	3.00	4	3.83	4	4.33	4	14.50
4	2.00	4	3.00	4	2.67	4	3.33	4	11.00
4	5.00	4	4.50	4	3.67	4	4.00	4	17.17
4	2.00	4	3.50	4	3.33	4	3.00	4	11.83
4	4.00	4	2.75	4	2.83	4	3.00	4	12.58
4	4.33	4	3.75	4	3.67	4	4.67	4	16.42
4	3.33	4	2.50	4	3.33	4	4.00	4	13.17
Year	**Fear fail**	**Year**	**Rel detail**	**Year**	**Surface**	**Year**	**Syll bound**	**Year**	**RO**
4	2.67	4	2.67	4	3.17	4	3.33	4	11.83
4	2.67	4	2.75	4	3.67	4	3.33	4	12.42
4	3.33	4	3.00	4	3.33	4	3.67	4	13.33
4	2.33	4	3.00	4	3.00	4	3.33	4	11.67
4	3.33	4	3.00	4	3.00	4	4.00	4	13.33

4	4.33	4	3.75	4	3.17	4	3.67	4	14.92
4	3.67	4	3.75	4	3.67	4	3.67	4	14.75
4	4.33	4	3.50	4	2.83	4	3.67	4	14.33

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Year	107	315	2.9439252	0.846
Fail	107	332	3.0996885	0.716

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	1.298027	1	1.298027	1.662	0.1987	3.886
Within	165.54465	212	0.780871			
Total	166.84268	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Year	107	315	2.9439252	0.846
Detail	107	340	3.1744548	0.335

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	2.8431983	1	2.8431983	4.817	0.02927	3.886
Within	125.14317	212	0.590298			
Total	127.98637	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Year	107	315	2.9439252	0.846
Surface	107	360	3.3654206	0.323

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	9.5047196	1	9.5047196	16.27	7.7E-05	3.886
Within	123.88339	212	0.5843556			
Total	133.3881	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Year	107	315	2.9439252	0.846
Syll	107	411	3.8380062	0.369

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*

Betwee	42.766874	1	42.766874	70.39	6.8E-15	3.886
Within (	128.8001	212	0.6075477			
Total	171.56698	213				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Year	107	315	2.9439252	0.846
RO	107	1442	13.47757	3.315

ANOVA

e of Va	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Betwee	5936.2356	1	5936.2356	2854	6E-125	3.886
Within (	441.02583	212	2.0803105			
Total	6377.2614	213				

Attachment 8 **ACADEMIC RESULTS**

Attach 8-1 **Results for all Co-op Graduates**

All	co-ops TER	with res 2Y	useable res FY	results co-op imp	Age
c1	95.75	16.67	16	4	23
c2	86.3	6	21.68	5	24
c3	79.3	16.67	19	4	23
c4	80.3	5	20	2	24
c5	93.7	15.63	16	4	23
c6	85.35	11.47	20	3.5	25
c7	91	11	16	5	23
c8	84.8	12	24	1	23
c9	TAFE	10	16.73	2	30
c10	80	4.4	12.8	2	25
c11	TAFE	7	2.92	4	25
c12	78	11	22.1	5	23
c13	83.65	16	24	3	23
c14	85	10	13.63	3.5	23
c15	79.85	23	13.33	2	23
c16	79.9	13	11	5	25
c17	90.4	12	27.67	5	23
c18	72	15	11.2	5	23
c19	MA	16	14	5	35
c20	USSR	2	12.67	4	36
c21	80.5	10	16.67	3	23
c22	82.5	20	15	3.5	23
c23	93.9	28.33	25.1	3	25
c24	89.55	19	16.73	3.5	25
c25	81	18.67	25	4	23
c26	98/164	10	8	5	25
c27	84.1	12.86	20.17	4	23
c28	81	14	16.89	4	23
c29	TAFE	14	15.65	4	29
c30	88.95	21.56	21.13	5	24
c31	80.75	9.33	15	na	23
c32	95	23	28.67	4	25
		13.58094	17.46063	3.65625	24.78125

Attach 8-2: Age Test

Co-op Age	Non Co-op No UG DRWE Age	Non Co-op UG DRWE Age
23	25	25
24	25	23
23	22	24
24	23	23
23	24	24
25	23	23
23	24	25
23	26	27
30	23	25
25	25	26
25	25	25
23	22	27
23	26	
23	29	
23	24	
25	27	
23	24	
23	24	
35	24	
36	24	
23	24	
23	25	
25	24	
25	23	
23		
25		
23		
23		
29		
24		
23		
25		

t-Test: Two-Sample Assuming Unequal Variances

	Co-op	*Non Co-op*
		no UG DRWE
Mean	24.78125	24.375
Variance	10.69254	2.418478261
Observations	32	24
Hypothesized M	0	
df	47	
t Stat	0.616017	
P(T<=t) one-tail	0.270428	
t Critical one-tail	1.677927	
P(T<=t) two-tail	0.540855	
t Critical two-tail	2.011739	

t-Test: Two-Sample Assuming Unequal Variances

	Co-op	*Non Co-op*
		UG DRWE
Mean	24.78125	24.75
Variance	10.69254	2.022727273
Observations	32	12
Hypothesized M	0	
df	41	
t Stat	0.044075	
P(T<=t) one-tail	0.482529	
t Critical one-tail	1.682879	
P(T<=t) two-tail	0.965058	
t Critical two-tail	2.019542	

t-Test: Two-Sample Assuming Unequal Variances

	Non co-op	*Non co-op*
	no UG DRW	*UG DRWE*
Mean	24.375	24.75
Variance	2.418478	2.022727273
Observations	24	12
Hypothesized M	0	
df	24	
t Stat	-0.722584	
P(T<=t) one-tail	0.238459	
t Critical one-tail	1.710882	
P(T<=t) two-tail	0.476918	
t Critical two-tail	2.063898	

Attach 8-3
Co-op test of means for academic results

2nd Year Results	
Mean	13.58094
Standard Error	1.042579
Median	12.93
Mode	10
Standard Deviation	5.897719
Sample Variance	34.78309
Kurtosis	0.162571
Skewness	0.343794
Range	26.33
Minimum	2
Maximum	28.33
Sum	434.59
Count	32

Final Year Results	
Mean	17.46063
Standard Error	1.004058
Median	16.7
Mode	16
Standard Devia	5.679808
Sample Varianc	32.26022
Kurtosis	0.290061
Skewness	-0.126764
Range	25.75
Minimum	2.92
Maximum	28.67
Sum	558.74
Count	32

Age	
Mean	24.78125
Standard Err	0.57805
Median	23
Mode	23
Standard De	3.269945
Sample Varia	10.69254
Kurtosis	6.267036
Skewness	2.557577
Range	13
Minimum	23
Maximum	36
Sum	793
Count	32

t-Test: Paired Two Sample for Means

	2nd year	*final year*
Mean	13.58094	17.46063
Variance	34.78309	32.26022
Observations	32	32
Pearson Correlatior	0.373157	
Hypothesized Mear	0	
df	31	
t Stat	-3.384721	
P(T<=t) one-tail	0.000974	
t Critical one-tail	1.695519	
P(T<=t) two-tail	0.001949	
t Critical two-tail	2.039515	

	Ho: ρ =0
t calc	2.202988
t crit 30df	
α = 0.01	2.75

t calc = r*sqrt (n-2)/(1-r^2)
df = n-2

Attach 8-4
Results for all Non Co-op Graduates.
Useable Results

	TER	res 2Y	res FY	co-op imp	Age
nc1	133/164	2.86	6.29	1	25
nc2	137/164	14.86	18	1	25
nc3	83.7	24	24	3	22
nc5	83.05	5	14.5	1	23
nc6	97.7	20.6	16	1	24
nc7	80.85	11	16	4	23
nc9	92.2	22	26	2	24
nc10	146/164	19	30	2	26
nc11	86	17	18	3	25
nc12	91	19	23	3	23
nc13	nr	15	12	4	25
nc14	152	26	26.7	1	25
nc15	94.5	18	30	1	23
nc16	74.3	20	20.6	5	24
nc17	95.6	20	20	3	22
nc18	156/164	20	17	1	26
nc19	69.75	22	25	0	23
nc20	90	21.4	20.4	3	24
nc21	Mature	30	29	3	29
nc22	83	10	10	2	24
nc23	48	23	31	3	23
nc24	121/164	18	25	2	27
nc25	88	13	19	1	24
nc27	nr	22.7	24	1	24
nc28	nr	10.7	21.3	1	24
nc29	125/164	9.8	12	1	25
nc30	72	20	22.9	2	24
nc31	97.1	9.8	14.2	1	27
nc32	72.9	17.8	22	3	24
nc33	130	26.7	24	1	25
nc34	129/164	23	25	1	26
nc35	140/164	22	24	4	25
nc36	162/164	22.7	19.2	1	25
nc37	nr	15.1	16	1.5	27
nc38	80.3	22	19	3	24
nc39	84.1	19	24	1	23

*useable results mean having results for both 2nd & final year

Attach 8-5 Results for Non Co-op Graduates with no UG DRWE

	TER	res 2Y	res FY	co-op imp	Age
nc1	133/164	2.86	6.29	1	25
nc2	137/164	14.86	18	1	25
nc3	83.7	24	24	3	22
nc5	83.05	5	14.5	1	23
nc6	97.7	20.6	16	1	24
nc7	80.85	11	16	4	23
nc9	92.2	22	26	2	24
nc10	146/164	19	30	2	26
nc12	91	19	23	3	23
nc13	nr	15	12	4	25
nc14	152	26	26.7	1	25
nc17	95.6	20	20	3	22
nc18	156/164	20	17	1	26
nc21	Mature	30	29	3	29
nc22	83	10	10	2	24
nc24	121/164	18	25	2	27
nc25	88	13	19	1	24
nc27	nr	22.7	24	1	24
nc28	nr	10.7	21.3	1	24
nc30	72	20	22.9	2	24
nc32	72.9	17.8	22	3	24
nc36	162/164	22.7	19.2	1	25
nc38	80.3	22	19	3	24
nc39	84.1	19	24	1	23

Attach 8-6 Test of Means for all Non Co-op Graduates

all non co-ops with useable results

2nd year results	
Mean	18.13944
Standard Error	1.002691
Median	19.5
Mode	22
Standard Deviati	6.016143
Sample Variance	36.19398
Kurtosis	0.30441
Skewness	-0.671387
Range	27.14
Minimum	2.86
Maximum	30
Sum	653.02
Count	36

Final year results	
Mean	20.69694
Standard Error	0.972445
Median	20.95
Mode	24
Standard Deviatio	5.834669
Sample Variance	34.04336
Kurtosis	-0.131628
Skewness	-0.360928
Range	24.71
Minimum	6.29
Maximum	31
Sum	745.09
Count	36

Age	
Mean	24.5
Standard Error	0.250397
Median	24
Mode	24
Standard Deviation	1.502379
Sample Variance	2.257143
Kurtosis	1.100382
Skewness	0.82966
Range	7
Minimum	22
Maximum	29
Sum	882
Count	36

t-Test: Paired Two Sample for Means

	2nd year	*final year*
Mean	18.13944	20.69694444
Variance	36.19398	34.04336468
Observations	36	36
Pearson Correlation	0.745676	
Hypothesized Mean	0	
df	35	
t Stat	-3.628198	
P(T<=t) one-tail	0.000451	
t Critical one-tail	1.689573	
P(T<=t) two-tail	0.000901	
t Critical two-tail	2.03011	

	Ho: $\rho = 0$
t =	6.52550893
t crit 34df	2.7
$\alpha = 0.01$	

non co-ops without UG deg related work

2nd year results	
Mean	17.7175
Standard Error	1.310793
Median	19
Mode	19
Standard Deviati	6.421546
Sample Variance	41.23625
Kurtosis	0.370339
Skewness	-0.618643
Range	27.14
Minimum	2.86
Maximum	30
Sum	425.22
Count	24

Final year results	
Mean	20.20375
Standard Error	1.193922
Median	20.65
Mode	24
Standard Deviatio	5.848998
Sample Variance	34.21077
Kurtosis	0.137455
Skewness	-0.539897
Range	23.71
Minimum	6.29
Maximum	30
Sum	484.89
Count	24

Age	
Mean	24.375
Standard Error	0.317443
Median	24
Mode	24
Standard Deviation	1.555146
Sample Variance	2.418478
Kurtosis	2.336515
Skewness	1.124344
Range	7
Minimum	22
Maximum	29
Sum	585
Count	24

t-Test: Paired Two Sample for Means

	2nd year	*final year*
Mean	17.7175	20.20375
Variance	41.23625	34.21077228
Observations	24	24
Pearson Correlation	0.741871	
Hypothesized Mean	0	
df	23	
t Stat	-2.742939	
P(T<=t) one-tail	0.005795	
t Critical one-tail	1.71387	
P(T<=t) two-tail	0.011589	
t Critical two-tail	2.068655	

	Ho: $\rho = 0$
t=	5.189354603
t crit 22df	2.819
$\alpha = 0.01$	

Attach 8-7 **Results for Non Co-op Graduates with UG DRWE**

	TER	res 2Y	res FY	co-op imp	Age
nc11	86	17	18	3	25
nc15	94.5	18	30	1	23
nc16	74.3	20	20.6	5	24
nc19	69.75	22	25	0	23
nc20	90	21.4	20.4	3	24
nc23	48	23	31	3	23
nc29	125/164	9.8	12	1	25
nc31	97.1	9.8	14.2	1	27
nc33	130	26.7	24	1	25
nc34	129/164	23	25	1	26
nc35	140/164	22	24	4	25
nc37	nr	15.1	16	1.5	27
		18.98333	21.68333333		24.75

nc26 was omitted because no age was recorded

second year results	
Mean	18.98333
Standard Error	1.521405
Median	20.7
Mode	22
Standard Deviati	5.2703
Sample Variance	27.77606
Kurtosis	-0.206757
Skewness	-0.713218
Range	16.9
Minimum	9.8
Maximum	26.7
Sum	227.8
Count	12

final year results	
Mean	21.68333
Standard Error	1.712602
Median	22.3
Mode	25
Standard Devia	5.932627
Sample Varian	35.19606
Kurtosis	-0.754302
Skewness	-0.042952
Range	19
Minimum	12
Maximum	31
Sum	260.2
Count	12

t-Test: Paired Two Sample for Means

	2nd year	*final year*
Mean	18.98333	21.68333
Variance	27.77606	35.19606
Observations	12	12
Pearson Correlation	0.756705	
Hypothesized Mean Difference	0	
df	11	
t Stat	-2.364065	
P(T<=t) one-tail	0.018772	
t Critical one-tail	1.795884	
P(T<=t) two-tail	0.037543	
t Critical two-tail	2.200986	

	Ho: $\rho = 0$
t=	3.660253
t crit 10df	3.169
$\alpha = 0.01$	

Attach 8-8 **Differences of Mean - Final Year Results**

res FY Co-op	res FY Non Co-op No DRWE	res FY Non Co-op DRWE
16	6.29	18
21.68	18	30
19	24	20.6
20	14.5	25
16	16	20.4
20	16	31
16	26	12
24	30	14.2
16.73	23	24
12.8	12	25
2.92	26.7	24
22.1	20	16
24	17	
13.63	29	
13.33	10	
11	25	
27.67	19	
11.2	24	
14	21.3	
12.67	22.9	
16.67	22	
15	19.2	
25.1	19	
16.73	24	
25		
8		
20.17		
16.89		
15.65		
21.13		
15		
28.67		

t-Test: Two-Sample Assuming Unequal Variances

	Co-op	*No DRWE*
Mean	17.460625	20.20375
Variance	32.260219	34.21077
Observations	32	24
Hypothesized Mea	0	
df	49	
t Stat	-1.75842	
P(T<=t) one-tail	0.0424602	
t Critical one-tail	1.6765512	
P(T<=t) two-tail	0.0849204	
t Critical two-tail	2.009574	

t-Test: Two-Sample Assuming Unequal Variances

	Co-op	*DRWE*
Mean	17.460625	21.68333
Variance	32.260219	35.19606
Observations	32	12
Hypothesized Mea	0	
df	19	
t Stat	-2.127063	
P(T<=t) one-tail	0.0233673	
t Critical one-tail	1.7291313	
P(T<=t) two-tail	0.0467345	
t Critical two-tail	2.0930247	

Attachment 9: ACADEMIC RESULTS BY GENDER

Attach 9-1 Co-op Academic Results by Gender

	Age	Gender FM=1	co-op=1		res 2Y	res FY	
c1		23	1	1	16.67	16	
c2		24	1	1	6	21.68	
c5		23	1	1	15.63	16	
c6		25	1	1	11.47	20	
c7		23	1	1	11	16	
c8		23	1	1	12	24	
c9		30	1	1	10	16.73	
c12		23	1	1	11	22.1	
c15		23	1	1	23	13.33	
c16		25	1	1	13	11	
c17		23	1	1	12	27.67	
c18		23	1	1	15	11.2	
c20		36	1	1	2	12.67	
c21		23	1	1	10	16.67	
c22		23	1	1	20	15	
c25		23	1	1	18.67	25	
					12.965	17.81563	n=16
c26		25	0	1	10	8	
c27		23	0	1	12.86	20.17	
c28		23	0	1	14	16.89	
c29		29	0	1	14	15.65	
c30		24	0	1	21.56	21.13	
c31		23	0	1	9.33	15	
c32		25	0	1	23	28.67	
c3		23	0	1	16.67	19	
c4		24	0	1	5	20	
c10		25	0	1	4.4	12.8	
c11		25	0	1	7	2.92	
c13		23	0	1	16	24	
c14		23	0	1	10	13.63	
c19		35	0	1	16	14	
c23		25	0	1	28.33	25.1	
c24		25	0	1	19	16.73	
					14.19688	17.10563	n=16

Attach 9-2 Non Co-op Academic Results by Gender

		FM=1	co-op=1	res 2Y	res FY	
nc11	25	1	1	17	18	
nc12	23	1	0	19	23	
nc13	25	1	0	15	12	
nc14	25	1	0	26	26.7	
nc16	24	1	1	20	20.6	
nc18	26	1	0	20	17	
nc19	23	1	1	22	25	
nc20	24	1	1	21.4	20.4	
nc22	24	1	0	10	10	
nc23	23	1	1	23	31	
nc24	27	1	0	18	25	
nc25	24	1	0	13	19	
nc34	26	1	1	23	25	
nc35	25	1	1	22	24	
nc36	25	1	0	22.7	19.2	
nc37	27	1	1	15.1	16	
nc38	24	1	0	22	19	
				19.36471	20.64118	n=17
nc39	23	0	0	19	24	
nc1	25	0	0	2.86	6.29	
nc2	25	0	0	14.86	18	
nc3	22	0	0	24	24	
nc5	23	0	0	5	14.5	
nc6	24	0	0	20.6	16	
nc7	23	0	0	11	16	
nc9	24	0	0	22	26	
nc10	26	0	0	19	30	
nc15	23	0	1	18	30	
nc17	22	0	0	20	20	
nc21	29	0	0	30	29	
nc27	24	0	0	22.7	24	
nc28	24	0	0	10.7	21.3	
nc29	25	0	1	9.8	12	
nc30	24	0	0	20	22.9	
nc31	27	0	1	9.8	14.2	
nc32	24	0	0	17.8	22	
nc33	25	0	1	26.7	24	
				17.04316	20.74684	

Attach 9-3 **Tests of Significance - Academic Results by Gender**

t-Test: Paired Two Sample for Means
Co-op: FM

	2nd yr	*final yr*
Mean	12.965	17.81563
Variance	27.05707	25.47713
Observations	16	16
Pearson Correlatior	-0.092866	
Hypothesized Mear	0	
df	15	
t Stat	-2.560717	
P(T<=t) one-tail	0.010866	
t Critical one-tail	1.753051	
P(T<=t) two-tail	0.021731	
t Critical two-tail	2.131451	

t-Test: Paired Two Sample for Means
non co-op FM

	2nd yr	*final yr*
Mean	19.36471	20.64118
Variance	17.52493	28.44132
Observations	17	17
Pearson Correlati	0.753409	
Hypothesized Me	0	
df	16	
t Stat	-1.499098	
P(T<=t) one-tail	0.07666	
t Critical one-tail	1.745884	
P(T<=t) two-tail	0.153319	
t Critical two-tail	2.119905	

t-Test: Paired Two Sample for Means
Co-op: M

	2nd yr	*final yr*
Mean	14.19688	17.10563
Variance	44.01865	40.92513
Observations	16	16
Pearson Correlatior	0.677084	
Hypothesized Mear	0	
df	15	
t Stat	-2.220004	
P(T<=t) one-tail	0.021125	
t Critical one-tail	1.753051	
P(T<=t) two-tail	0.042249	
t Critical two-tail	2.131451	

t-Test: Paired Two Sample for Means
non co-op M

	2nd yr	*final yr*
Mean	17.04316	20.74684
Variance	52.11299	40.90869
Observations	19	19
Pearson Correlati	0.78113	
Hypothesized Me	0	
df	18	
t Stat	-3.532281	
P(T<=t) one-tail	0.00119	
t Critical one-tail	1.734063	
P(T<=t) two-tail	0.00238	
t Critical two-tail	2.100924	

Co-op FM	
Ho:ρ =0	
t =	-0.348981
tcrit, 14df	
α = 0.01	2.977

Non Co-op FM	
Ho:ρ =0	
t =	4.437575
tcrit, 15df	
α = 0.01	2.947

Co-op M	
Ho:ρ =0	
t =	3.442581
tcrit, 14df	
α = 0.01	2.977

Non Co-op M	
Ho:ρ =0	
t =	5.1583
tcrit, 17df	
α = 0.01	2.898

Second Year - Co-op
t-Test: Two-Sample Assuming Unequal Variances

	FM	*Male*
Mean	12.965	14.19688
Variance	27.05707	44.01865
Observatio	16	16
Hypothesiz	0	
df	28	
t Stat	-0.584475	
P(T<=t) on	0.28179	
t Critical on	1.70113	
P(T<=t) tw	0.563581	
t Critical tw	2.048409	

Second Year - Non co-op
t-Test: Two-Sample Assuming Unequal Variances

	FM	*M*
Mean	19.36471	17.04316
Variance	17.52493	52.11299
Observatio	17	19
Hypothesiz	0	
df	29	
t Stat	1.195077	
P(T<=t) on	0.12087	
t Critical on	1.699127	
P(T<=t) tw	0.241739	
t Critical tw	2.045231	

Attachment 10 **TESTS OF SIGNIFICANCE -CO-OP HIGH/LOW RESULTS**

Label	Gender	Low 2Y res	res FY
C2	F	6	21.68
C4	M	5	20
C6	F	11.47	20
C7	F	11	16
C8	F	12	24
C9	F	10	16.73
C10	M	4.4	12.8
C11	M	7	2.92
C12	F	11	22.1
C14	M	10	13.63
C17	F	12	27.67
C20	F	2	12.67
C21	F	10	16.67
C26	M	10	8
C27	M	12.86	20.17
C31	M	9.33	15

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	9.00375	16.8775
Variance	10.017945	38.049607
Observations	16	16
Pearson Correlatio	0.4062854	
Hypothesized Mea	0	
df	15	
t Stat	-5.549999	
P(T<=t) one-tail	2.78E-05	
t Critical one-tail	1.753051	
P(T<=t) two-tail	5.56E-05	
t Critical two-tail	2.1314509	

Low	results
Ho:ρ =0	
t =	1.6636796
tcrit, 14df	
α = 0.05	2.145

	Gender	High 2Y res	res FY
C1	F	16.67	16
C3	M	16.67	19
C5	F	15.63	16
C13	M	16	24
C15	F	23	13.33
C16	F	13	11
C18	F	15	11.2
C19	M	16	14
C22	F	20	15
C23	M	28.33	25.1
C24	M	19	16.73
C25	F	18.67	25
C28	M	14	16.89
C29	M	14	15.65
C30	M	21.56	21.13
C32	M	23	28.67

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	18.158125	18.04375
Variance	17.172403	27.896105
Observations	16	16
Pearson Correlatio	0.5577273	
Hypothesized Mea	0	
df	15	
t Stat	0.1006662	
P(T<=t) one-tail	0.4605743	
t Critical one-tail	1.753051	
P(T<=t) two-tail	0.9211486	
t Critical two-tail	2.1314509	

High	results
Ho:ρ =0	
t =	2.5141728
tcrit, 14df	
α = 0.05	2.145

Attachment 11 ACADEMIC OUTCOMES FOR CO-OP GRADUATES AND NON CO-OP GRADUATES

Attach 11-1 TER Scores & Academic Progress of Co-op Graduates

Co-op	results TER	res 2Y	res FY	co-op imp	Age
c1	95.75	16.67	16	4	23
c2	86.3	6	21.68	5	24
c3	79.3	16.67	19	4	23
c4	80.3	5	20	2	24
c5	93.7	15.63	16	4	23
c6	85.35	11.47	20	3.5	25
c7	91	11	16	5	23
c8	84.8	12	24	1	23
c10	80	4.4	12.8	2	25
c12	78	11	22.1	5	23
c13	83.65	16	24	3	23
c14	85	10	13.63	3.5	23
c15	79.85	23	13.33	2	23
c16	79.9	13	11	5	25
c17	90.4	12	27.67	5	23
c18	72	15	11.2	5	23
c21	80.5	10	16.67	3	23
c22	82.5	20	15	3.5	23
c23	93.9	28.33	25.1	3	25
c24	89.55	19	16.73	3.5	25
c25	81	18.67	25	4	23
c27	84.1	12.86	20.17	4	23
c28	81	14	16.89	4	23
c30	88.95	21.56	21.13	5	24
c31	80.75	9.33	15	na	23
c32	95	23	28.67	4	25
	84.71	14.44577	18.79885	2.90625	23.58

t-Test: Paired Two Sample for Means

	2Y results	*FY results*
Mean	14.44577	18.79884615
Variance	33.98916	24.55334662
Observations	26	26
Pearson Correlatio	0.247674	
Hypothesized Mea	0	
df	25	
t Stat	-3.337426	
P(T<=t) one-tail	0.001324	
t Critical one-tail	1.70814	
P(T<=t) two-tail	0.002648	
t Critical two-tail	2.059537	

t-Test: Two-Sample Assuming Unequal Variances

	Co-op TER	*non co-op TER*
Mean	84.71346	82.6275
Variance	36.03811	129.2422303
Observatio	26	20
Hypothesiz	0	
df	27	
t Stat	0.744597	
P(T<=t) on	0.231474	
t Critical on	1.703288	
P(T<=t) tw	0.462947	
t Critical tw	2.051829	

TER	co-ops
Ho:ρ =0	
t =	1.252368452
tcrit, 24df	
α = 0.01	2.797

Attach 11-2 **TER Scores & Academic Progress of Non Co-op Graduates**

	TER	res 2Y	res FY	co-op imp	Age
nc3	83.7	24	24	3	22
nc5	83.05	5	14.5	1	23
nc6	97.7	20.6	16	1	24
nc7	80.85	11	16	4	23
nc9	92.2	22	26	2	24
nc11	86	17	18	3	25
nc12	91	19	23	3	23
nc15	94.5	18	30	1	23
nc16	74.3	20	20.6	5	24
nc17	95.6	20	20	3	22
nc19	69.75	22	25	0	23
nc20	90	21.4	20.4	3	24
nc22	83	10	10	2	24
nc23	48	23	31	3	23
nc25	88	13	19	1	24
nc26	85.6	17.6	7.2	1	25
nc30	72	20	22.9	2	24
nc32	72.9	17.8	22	3	24
nc38	80.3	22	19	3	24
nc39	84.1	19	24	1	23
	82.6275	18.12	20.43	1.184211	23.55

t-Test: Paired Two Sample for Means

	2Y results	FY results
Mean	18.12	20.43
Variance	23.64379	34.96432
Observations	20	20
Pearson Correlation	0.575055	
Hypothesized Mean D	0	
df	19	
t Stat	-2.044172	
P(T<=t) one-tail	0.027524	
t Critical one-tail	1.729131	
P(T<=t) two-tail	0.055048	
t Critical two-tail	2.093025	

TER non	co-ops
Ho:ρ =0	
t =	2.982166
tcrit, 18df	
α = 0.01	2.878

t-Test: Two-Sample Assuming Unequal Var
FY results

	co-ops	*non co-ops*
Mean	18.79885	20.43
Variance	24.55335	34.96432
Observatio	26	20
Hypothesiz	0	
df	37	
t Stat	-0.994056	
P(T<=t) on	0.163326	
t Critical on	1.687094	
P(T<=t) tw	0.326652	
t Critical tw	2.02619	

t-Test: Two-Sample Assuming Unequal Var
2Y results

	co-ops	*non co-ops*
Mean	14.44577	18.12
Variance	33.98916	23.64379
Observatio	26	20
Hypothesiz	0	
df	44	
t Stat	-2.328699	
P(T<=t) on	0.012266	
t Critical on	1.68023	
P(T<=t) tw	0.024532	
t Critical tw	2.015367	

Attach 11-3 Descriptive Statistics - All TER Scores and Academic Progress

Co-op 2nd yr results	
Mean	14.44577
Standard Erro	1.143361
Median	13.5
Mode	16.67
Standard Devi	5.830022
Sample Variar	33.98916
Kurtosis	0.008362
Skewness	0.381394
Range	23.93
Minimum	4.4
Maximum	28.33
Sum	375.59
Count	26

Co-op final yr results	
Mean	18.79885
Standard E	0.971782
Median	17.945
Mode	16
Standard D	4.955133
Sample Va	24.55335
Kurtosis	-0.779202
Skewness	0.312399
Range	17.67
Minimum	11
Maximum	28.67
Sum	488.77
Count	26

Co-op TER	
Mean	84.71346
Standard E	1.17732
Median	83.875
Mode	81
Standard D	6.003175
Sample Va	36.03811
Kurtosis	-0.454724
Skewness	0.275294
Range	23.75
Minimum	72
Maximum	95.75
Sum	2202.55
Count	26

Non co-op 2nd yr result	
Mean	18.12
Standard Erro	1.087285
Median	19.5
Mode	22
Standard Devi	4.862488
Sample Variar	23.64379
Kurtosis	1.613043
Skewness	-1.385567
Range	19
Minimum	5
Maximum	24
Sum	362.4
Count	20

Non co-op fin yr result	
Mean	20.43
Standard E	1.322201
Median	20.5
Mode	24
Standard D	5.913063
Sample Va	34.96432
Kurtosis	0.431816
Skewness	-0.396119
Range	23.8
Minimum	7.2
Maximum	31
Sum	408.6
Count	20

Non co-op TER	
Mean	82.6275
Standard E	2.542068
Median	83.9
Mode	#N/A
Standard D	11.36848
Sample Va	129.2422
Kurtosis	3.419044
Skewness	-1.472757
Range	49.7
Minimum	48
Maximum	97.7
Sum	1652.55
Count	20

Attachment 12 **EMPLOYMENT OUTCOMES FOR CO-OP GRADUATES AND NON CO-OP GRADUATES**

Attach 12-1: Useable Results for all Graduates

	TER	results 2Y	results FY	co-op imp	Age	UG drwe (co-op) = 1	gender FM=1	Job search time (mth)	Total=FT time with coop em	Total =time (inc cop) in FT Employt	$thous co-op salary	$thous post co-op salary	$thous start FT salary	$thous current salary
c1		95.75	16.67	16	4	23	1	1	0.5	1	2	27	na	37	38
c2		86.3	6	21.68	5	24	1	1	0.5	1	2	31.2	na	35	45
c3		79.3	16.67	19	4	23	1	0	5	1	2	27.75	na	38.5	40
c4		80.3	5	20	2	24	1	0	2.5	1	1.5	OS	na	40	40
c5		93.7	15.63	16	4	23	1	1	0	3	3	25	28	35	44
c6		85.35	11.47	20	3.5	25	1	1	0.5	1	2	25	na	29	40
c7		91	11	16	5	23	1	1	0	3	3	28	36.5	38.5	43.5
c8		84.8	12	24	1	23	1	1	0	2.5	2.75	25	32	34	42
c9	TAFE		10	16.73	2	30	1	1	0	3	3	nr	32	37	61.67
c10		80	4.4	12.8	2	25	1	0	0.75	2	3.5	27.2	31.5	35	38
c11	TAFE		7	2.92	4	25	1	0	0	3	3	22	33	38.5	40
c12		78	11	22.1	5	23	1	1	0	2.5	2.5	21	26	30	30
c13		83.65	16	24	3	23	1	0	0.25	1.1	3	22	35	50	60
c14		85	10	13.63	3.5	23	1	0	0	3	3	27.3	32.5	36	36
c15		79.85	23	13.33	2	23	1	1	0	2.5	2.5	21	31.2	40	46
c16		79.9	13	11	5	25	1	1	0	3	3	26.5	32	49	60
c17		90.4	12	27.67	5	23	1	1	0.5	1.2	2.2	24	24	35	OS
c18		72	15	11.2	5	23	1	1	0	3	3	22	30	32	33
c19	MA		16	14	5	35	1	0	0	3.5	3.5	28	32	54	65
c20	USSR		2	12.67	4	36	1	1	0	1	2.6	20	22	31	35
c21		80.5	10	16.67	3	23	1	1	0.5	1	3	21	32	38	40.66
c22		82.5	20	15	3.5	23	1	1	0	1	2.6	24	34	38	40
c23		93.9	28.33	25.1	3	25	1	0	0	3.25	3.25	24.7	33	43	48
c24		89.55	19	16.73	3.5	25	1	0	0	2.2	2.2	24	24	30	40
c25		81	18.67	25	4	23	1	1	0	3	3	28	36.5	42	45
c26	98/164		10	8	5	25	1	0	0	2	3.6	26	28	33	35
c27		84.1	12.86	20.17	4	23	1	0	1.5	1	2	28.6	na	34	34
c28		81	14	16.89	4	23	1	1	0.25	2	2.5	28.2	40	34	34
c29	TAFE		14	15.65	4	29	1	1	0	3	3	25	27	32	35
c30		88.95	21.56	21.13	5	24	1	1	0		2	25.9	na	41	46

									Total=FT	Total =time	$thous	$thous	$thous	$thous
		results	results		UG drwe	gender	Job search	time with	(inc cop) in	co-op	post co-op	start FT	current	

	TER	2Y	FY	co-op imp	Age	(co-op) = 1	FM=1	time (mth)	coop em	FT Employt	salary	salary	salary	salary
**c31	80.75	9.33	15	na	23	1	1	**na**		**na**		37.5	**na**	**na**
**c32	95	23	28.67	4	25	1	1	**na**		**na**			**na**	**na**
nc1	133/164	2.86	6.29	1	25	0	0	0		1			25	29
nc2	137/164	14.86	18	1	25	0	0	0		2			34.1	44
nc3	83.7	24	24	3	22	0	0	6		1			42	60
*nc4	82.15	13	**na**	1	22	0	1	6		1			30	36.5
nc5	83.05	5	14.5	1	23	0	0	3.5		1.5			27.5	32.5
nc6	97.7	20.6	16	1	24	0	0	0		0.5			**nr**	25
nc7	80.85	11	16	4	23	0	0	1.5		1			27.5	40
*nc8	93.25	**na**	**na**	3	23	0	1	2		0.5			44.6	44.6
nc9	92.2	22	26	2	24	0	0	4		1			36.259	36.259
nc10	146/164	19	30	2	26	0	0	0		1			34	50
nc11	86	17	18	3	25	**1**	1	0		4			28	60
nc12	91	19	23	3	23	0	1	12		0.5			28	28
nc13	nr	15	12	4	25	0	1	2		4			33	56.1
nc14	152	26	26.7	1	25	0	1	4		2			32	55
nc15	94.5	18	30	1	23	**1**	0	0		6			34	63
nc16	74.3	20	20.6	5	24	**1**	1	2		5			31	39
nc17	95.6	20	20	3	22	0	0	1		2			29	39
nc18	156/164	20	17	1	26	0	1	2		2			32	55
nc19	69.75	22	25	0	23	**1**	1	2		2.5			28.5	38
nc20	90	21.4	20.4	3	24	**1**	1	2.5		6			30.5	45
nc21	Mature	30	29	3	29	0	0	1		2			29.5	75
nc22	83	10	10	2	24	0	1	12		2.5			27.57	48.15
nc23	48	23	31	3	23	**1**	1	0		2.5			31.5	42
nc24	121/164	18	25	2	27	0	1	2		2.5			21	35.56
nc25	88	13	19	1	24	0	1	3		2.5			27	39
*nc26***	85.6	17.6	7.2	1	**nr**	**1**	1	0.75		4	**nr**		**nr**	**nr**
nc27	nr	22.7	24	1	24	0	0	4		3			29	60
nc28	nr	10.7	21.3	1	24	0	0	3		2			#29.859	35.656

	TER	results 2Y	results FY	co-op imp	Age	UG drwe (co-op) = 1	gender FM=1	Job search time (mth)	Total=FT time with coop em	Total =time (inc cop) in FT Employt	$thous co-op salary	$thous post co-op salary	$thous start FT salary	$thous current salary
nc29	125/164	9.8	12	1	25	**1**	0	4		2.5			30	55

nc30		72	20	22.9	2	24	0	0	6	2	31	36
nc31		97.1	9.8	14.2	1	27	**1**	0	1	4.5	35	50
nc32		72.9	17.8	22	3	24	0	0	8	2	28	31.5
nc33		130	26.7	24	1	25	**1**	0	2	2.5	32	37.585
nc34	129/164		23	25	1	26	**1**	1	0.5	5	32	56.1
nc35	140/164		22	24	4	25	**1**	1	0.5	2.5	31.2	42.5
nc36	162/164		22.7	19.2	1	25	0	1	0.5	2.5	31	56
nc37	nr		15.1	16	1.5	27	**1**	1	0	8	33	41.248
nc38***		80.3	22	19	3	24	0	1	**24**	2	31	37
nc39		84.1	19	24	1	23	0	0	2	2	29.5	39

*not useat results for academi since one resul is missing

** not usec for employt outcome results

*** not use for job search time

NZ$ in 9 still tb convert

Attach 12-2: Analysis of Job Search Time

Attach 12-2a: Descriptive Statistics - Job Search Time

Job search time - Co-ops	
Mean	0.425
Standard Error	0.18575336
Median	0
Mode	0
Standard Deviation	1.01741305
Sample Variance	1.03512931
Kurtosis	14.8181105
Skewness	3.66601976
Range	5
Minimum	0
Maximum	5
Sum	12.75
Count	30

Non co-ops with no DRWE	
Mean	3.42
Standard Error	0.67124263
Median	2
Mode	2
Standard Deviation	3.35621314
Sample Variance	11.2641667
Kurtosis	1.70387302
Skewness	1.40960542
Range	12
Minimum	0
Maximum	12
Sum	85.5
Count	25

No DRWE	
nc1	0
nc2	0
nc3	6
*nc4	6
nc5	3.5
nc6	0
nc7	1.5
*nc8	2
nc9	4
nc10	0
nc12	12
nc13	2
nc14	4
nc17	1
nc18	2
nc21	1
nc22	12
nc24	2
nc25	3
nc27	4
nc28	3
nc30	6
nc32	8
nc36	0.5
nc39	2
nc38***	**24**

DRWE	
nc11	0
nc15	0
nc16	2
nc19	2
nc20	2.5
nc23	0
*nc26***	0.75
nc29	4
nc31	1
nc33	2
nc34	0.5
nc35	0.5
nc37	0

Non co-ops with DRWE	
Mean	1.1730769
Standard Error	0.3436519
Median	0.75
Mode	0
Standard Deviatior	1.2390546
Sample Variance	1.5352564
Kurtosis	0.5410418
Skewness	1.0083263
Range	4
Minimum	0
Maximum	4
Sum	15.25
Count	13

Attach 12-2b: ANOVA-JST

co-op	**No DRWE**	**DRWE**

0.5	0	0
0.5	0	0
5	6	2
2.5	6	2
0	3.5	2.5
0.5	0	0
0	1.5	0.75
0	2	4
0	4	1
0.75	0	2
0	12	0.5
0	2	0.5
0.25	4	0
0	1	
0	2	
0	1	
0.5	12	
0	2	
0	3	
0	4	
0.5	3	
0	6	
0	8	
0	0.5	
0	2	
0		
1.5		
0.25		
0		
0		

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
co-op	30	12.75	0.425	1.035129
No DRWE	25	85.5	3.42	11.26417
DRWE	13	15.25	1.1730769	1.535256

ANOVA

Source of Varia	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between G	126.2733	2	63.13666	12.87364	1.95E-05	3.13814
Within Gro	318.7818	65	4.9043358			
Total	445.0551	67				

t-Test: Two-Sample Assuming Unequal Variances

	co-op	*No DRWE*
Mean	0.425	3.42
Variance	1.035129	11.26416667
Observatio	30	25
Hypothesiz	0	
df	28	
t Stat	-4.300255	
P(T<=t) on	9.35E-05	
t Critical on	1.70113	
P(T<=t) tw	0.000187	
t Critical tw	2.048409	

Attach 12-3:Total Time in DRWE - All Graduates

Years Co-op	UG DRWE	no UG DRWE
2	4	1
2	6	2
2	5	1
1.5	2.5	1
3	6	1.5
2	2.5	0.5
3	4	1
2.75	2.5	0.5
3	4.5	1
3.5	2.5	1
3	5	0.5
2.5	2.5	4
3	8	2
3		2
2.5		2
3		2
2.2		2.5
3		2.5
3.5		2.5
2.6		3
3		2
2.6		2
3.25		2
2.2		2.5
3		2
3.6		2
2		
2.5		
3		
2		

Co-op	
Mean	2.673333
Standard Error	0.098165
Median	2.875
Mode	3
Standard Devia	0.537673
Sample Varian	0.289092
Kurtosis	-0.72889
Skewness	-0.279105
Range	2.1
Minimum	1.5
Maximum	3.6
Sum	80.2
Count	30

no UG DRWE	
Mean	1.769231
Standard Error	0.164623
Median	2
Mode	2
Standard Devia	0.839414
Sample Varian	0.704615
Kurtosis	0.508931
Skewness	0.422355
Range	3.5
Minimum	0.5
Maximum	4
Sum	46
Count	26

UG DRWE	
Mean	4.230769
Standard E	0.485743
Median	4
Mode	2.5
Standard D	1.751373
Sample Va	3.067308
Kurtosis	-0.014183
Skewness	0.726133
Range	5.5
Minimum	2.5
Maximum	8
Sum	55
Count	13

t-Test: Two-Sample Assuming Unequal Var

	Co-op	*no UG DRWE*
Mean	2.673333	1.769230769
Variance	0.289092	0.704615385
Observatio	30	26
Hypothesiz	0	
df	41	
t Stat	4.717	
P(T<=t) on	1.39E-05	
t Critical on	1.682879	
P(T<=t) tw	2.77E-05	
t Critical tw	2.019542	

t-Test: Two-Sample Assuming Unequal Variances

	Co-op	*UG DRWE*
Mean	2.673333	4.23076923
Variance	0.289092	3.06730769
Observatio	30	13
Hypothesiz	0	
df	13	
t Stat	-3.142758	
P(T<=t) on	0.00389	
t Critical on	1.770932	
P(T<=t) tw	0.007779	
t Critical tw	2.160368	

Attach 12-4 - Co-op Salaries

	co-op salary	post co-op salary	start FT salary	current salary $ thousand
c1	27		37	38
c2	31.2		35	45
c3	27.75		38.5	40
c4			40	40
c5	25	28	35	44
c6	25		29	40
c7	28	36.5	38.5	43.5
c8	25	32	34	42
c9		32	37	61.67
c10	27.2	31.5	35	38
c11	22	33	38.5	40
c12	21	26	30	30
c13	22	35	50	60
c14	27.3	32.5	36	36
c15	21	31.2	40	46
c16	26.5	32	49	60
c17	24	24	35	
c18	22	30	32	33
c19	28	32	54	65
c20	20	22	31	35
c21	21	32	38	40.66
c22	24	34	38	40
c23	24.7	33	43	48
c24	24	24	30	40
c25	28	36.5	42	45
c26	26	28	33	35
c27	28.6		34	34
c28	28.2	40	34	34
c29	25	27	32	35
c30	25.9		41	46

Co-op salaries	
Mean	25.19107
Standard Error	0.535092
Median	25
Mode	25
Standard Deviati	2.831439
Sample Variance	8.017047
Kurtosis	-0.650947
Skewness	-0.122704
Range	11.2
Minimum	20
Maximum	31.2
Sum	705.35
Count	28

Starting Co-op Grad Salary	
Mean	37.31667
Standard Error	1.077855
Median	36.5
Mode	35
Standard Deviati	5.903657
Sample Variance	34.85316
Kurtosis	1.493333
Skewness	1.168191
Range	25
Minimum	29
Maximum	54
Sum	1119.5
Count	30

Post co-op salaries	
Mean	30.96522
Standard E	0.912162
Median	32
Mode	32
Standard D	4.374576
Sample Va	19.13692
Kurtosis	-0.013018
Skewness	-0.260353
Range	18
Minimum	22
Maximum	40
Sum	712.2
Count	23

Current Co-op grad sal	
Mean	42.58034
Standard E	1.660979
Median	40
Mode	40
Standard D	8.944646
Sample Va	80.00669
Kurtosis	0.99244
Skewness	1.235036
Range	35
Minimum	30
Maximum	65
Sum	1234.83
Count	29

Attach 12-5 Non Co-op Salaries

NC with no DRWE	start FT salary	current salary $ thousand
nc1	25	29
nc2	34.1	44
nc3	42	60
*nc4	30	36.5
nc5	27.5	32.5
nc7	27.5	40
*nc8	44.6	44.6
nc9	36.259	36.259
nc10	34	50
nc12	28	28
nc13	33	56.1
nc14	32	55
nc17	29	39
nc18	32	55
nc21	29.5	75
nc22	27.57	48.15
nc24	21	35.56
nc25	27	39
nc27	29	60
nc28	29.859	35.656
nc30	31	36
nc32	28	31.5
nc36	31	56
nc38***	31	37
nc39	29.5	39

NC with DRWE	start FT salary	current salary $ thousand
nc11	28	60
nc15	34	63
nc16	31	39
nc19	28.5	38
nc20	30.5	45
nc23	31.5	42
nc29	30	55
nc31	35	50
nc33	32	37.585
nc34	32	56.1
nc35	31.2	42.5
nc37	33	41.248

Non co-op NO DRWE Grad Sal

Mean	30.77552
Standard Error	0.981524
Median	29.859
Mode	31
Standard Deviat	4.907622
Sample Varianc	24.08475
Kurtosis	2.535606
Skewness	1.135288
Range	23.6
Minimum	21
Maximum	44.6
Sum	769.388
Count	25

Non co-op NO DRWE Current Sal

Mean	43.953
Standard E	2.3414619
Median	39
Mode	39
Standard D	11.7073095
Sample Va	137.061096
Kurtosis	0.33657049
Skewness	0.86337124
Range	47
Minimum	28
Maximum	75
Sum	1098.825
Count	25

Non Co-ops WITH DRWE

Grad Sal		*Current Sal*	
Mean	31.39167	Mean	47.45275
Standard Erro	0.59	Standard E	2.602924
Median	31.35	Median	43.75
Mode	32	Mode	#N/A
Standard Dev	2.043819	Standard D	9.016792
Sample Varia	4.177197	Sample Va	81.30254
Kurtosis	-0.15531	Kurtosis	-1.228361
Skewness	0.034139	Skewness	0.577344
Range	7	Range	25.415
Minimum	28	Minimum	37.585
Maximum	35	Maximum	63
Sum	376.7	Sum	569.433
Count	12	Count	12

count=12 as one grad did not enter salary

Attach 12-6 Testing Differences of Means - All Salaries

t-Test: Two-Sample Assuming Unequal Variances

	Current Salaries No DRWE	
	Co-ops	*Non co-ops*
Mean	42.58034	43.224038
Variance	80.00669	145.39466
Observations	29	26
Hypothesized Me	0	
df	46	
t Stat	-0.222747	
P(T<=t) one-tail	0.412359	
t Critical one-tail	1.678659	
P(T<=t) two-tail	0.824719	
t Critical two-tail	2.012894	

t-Test: Two-Sample Assuming Unequal Variances

	Current Salaries DRWE	
	Co-ops	*Non co-ops*
Mean	42.58034	47.45275
Variance	80.00669	81.30254
Observations	29	12
Hypothesized Mea	0	
df	20	
t Stat	-1.577991	
P(T<=t) one-tail	0.065127	
t Critical one-tail	1.724718	
P(T<=t) two-tail	0.130254	
t Critical two-tail	2.085962	

t-Test: Two-Sample Assuming Unequal Variances

	Start 1999	Salaries 1999 No DRWE
	Co-ops	*Non co-ops*
Mean	30.96522	30.77552
Variance	19.13692	24.084753
Observations	23	25
Hypothesized Me	0	
df	46	
t Stat	0.141572	
P(T<=t) one-tail	0.444018	
t Critical one-tail	1.678659	
P(T<=t) two-tail	0.888036	
t Critical two-tail	2.012894	

t-Test: Two-Sample Assuming Unequal Variances

	Salaries 2000	1999 No DRWE
	Co-ops	*Non co-ops*
Mean	37.31667	30.77552
Variance	34.85316	24.084753
Observations	30	25
Hypothesized Mea	0	
df	53	
t Stat	4.487018	
P(T<=t) one-tail	1.96E-05	
t Critical one-tail	1.674116	
P(T<=t) two-tail	3.92E-05	
t Critical two-tail	2.005745	

t-Test: Two-Sample Assuming Unequal Variances

	Start 1999	Salaries 1999 DRWE
	Co-ops	*Non co-ops*
Mean	30.96522	31.391667
Variance	19.13692	4.177197
Observations	23	12
Hypothesized Me	0	
df	33	
t Stat	-0.392555	
P(T<=t) one-tail	0.348586	
t Critical one-tail	1.69236	
P(T<=t) two-tail	0.697172	
t Critical two-tail	2.034517	

t-Test: Two-Sample Assuming Unequal Variances

	Start Salaries 2000	1999 DRWE
	Co-ops	*Non co-ops*
Mean	37.31667	31.391667
Variance	34.85316	4.177197
Observations	30	12
Hypothesized Mea	0	
df	40	
t Stat	4.821901	
P(T<=t) one-tail	1.04E-05	
t Critical one-tail	1.683852	
P(T<=t) two-tail	2.08E-05	
t Critical two-tail	2.021075	

t-Test: Two-Sample Assuming Unequal Variances

	Start salaries 1999	1999

	No DRWE	DRWE
	Non co-ops	*Non co-ops*
Mean	30.77552	31.391667
Variance	24.08475	4.177197
Observations	25	12
Hypothesized Me	0	
df	35	
t Stat	-0.538024	
P(T<=t) one-tail	0.296983	
t Critical one-tail	1.689573	
P(T<=t) two-tail	0.593966	
t Critical two-tail	2.03011	

Attach 12-7 **Testing Differences of Means - Co-op Salaries Over Time**

	co-op salary	post co-op salary	start FT salary with post co-op exp -1	start FT salary with no post co-op exp - 2
c1	27			37
c2	31.2			35
c3	27.75			38.5
c4				40
c5	25	28	35	
c6	25			29
c7	28	36.5	38.5	
c8	25	32	34	
c9		32	37	
c10	27.2	31.5	35	
c11	22	33	38.5	
c12	21	26	30	
c13	22	35	50	
c14	27.3	32.5	36	
c15	21	31.2	40	
c16	26.5	32	49	
c17	24	24	35	
c18	22	30	32	
c19	28	32	54	
c20	20	22	31	
c21	21	32	38	
c22	24	34	38	
c23	24.7	33	43	
c24	24	24	30	
c25	28	36.5	42	
c26	26	28	33	
c27	28.6			34
c28	28.2	40	34	
c29	25	27	32	
c30	25.9			41

t-Test: Two-Sample Assuming Unequal Variances

	Co-ops1	*Co-ops2*
Mean	37.6087	36.35714
Variance	40.95356	16.89286
Observatio	23	7
Hypothesiz	0	
df	16	
t Stat	0.611142	
P(T<=t) on	0.274845	
t Critical on	1.745884	
P(T<=t) tw	0.54969	
t Critical tw	2.119905	

Co-ops 1		*Co-ops 2*	
Mean	37.6087	Mean	36.35714
Standard E	1.334387	Standard E	1.553469
Median	36	Median	37
Mode	35	Mode	#N/A
Standard D	6.399497	Standard D	4.110092
Sample Va	40.95356	Sample Va	16.89286
Kurtosis	1.00867	Kurtosis	0.529772
Skewness	1.190878	Skewness	-0.857941
Range	24	Range	12
Minimum	30	Minimum	29
Maximum	54	Maximum	41
Sum	865	Sum	254.5
Count	23	Count	7

Attach 12-8 **Testing Variability in Current Salaries**

NC with	no DRWE start FT salary	current salary $ thousand
nc1	25	29
nc3	42	60
nc4	30	36.5
nc6		25
nc7	27.5	40
nc8	44.6	44.6
nc10	34	50
nc12	28	28
nc38	31	37

t-Test: Two-Sample Assuming Unequal Variances
co-ops with 4 year degree
non co-ops with degree plus one-year work exp

	Co-ops	*Non co-ops*
Mean	37.31666667	38.9
Variance	34.85316092	127.69
Observations	30	9
Hypothesized Mea	0	
df	9	
t Stat	-0.404133204	
P(T<=t) one-tail	0.347774811	
t Critical one-tail	1.833113856	
P(T<=t) two-tail	0.695549622	
t Critical two-tail	2.262158887	

Mean	32.7625	Mean	38.9
Standard E	2.494132	Standard E	3.766667
Median	30.5	Median	37
Mode	#N/A	Mode	#N/A
Standard D	7.054469	Standard D	11.3
Sample Va	49.76554	Sample Va	127.69
Kurtosis	-0.483916	Kurtosis	-0.04468
Skewness	0.922804	Skewness	0.665676
Range	19.6	Range	35
Minimum	25	Minimum	25
Maximum	44.6	Maximum	60
Sum	262.1	Sum	350.1
Count	8	Count	9

F-Test Two-Sample for Variances

	Non co-ops	*Co-ops*
Mean	38.9	37.31667
Variance	127.69	34.85316
Observations	9	30
df	8	29
F	3.663656	
P(F<=f) one-tail	0.004602	
F Critical one-tail	2.278249	

Attach 12-9 Job & Salary Satisfaction Levels

Co-op Graduates = 1
Non Co-op Graduates with DRWE = 2
Non Co-op Graduates with no DRWE = 3

Grad	Job Sat	Grad	Sal Sat
1	4	1	4
1	4.5	1	4
1	4	1	4
1	4	1	4
1	3.5	1	3.5
1	4	1	3
1	5	1	4
1	3	1	5
1	2	1	4
1	4	1	4
1	3	1	3
1	3.5	1	3
1	4	1	4
1	3.5	1	3
1	4	1	5
1	5	1	5
1	5	1	3
1	3	1	2
1	4	1	3
1	5	1	3
1	4	1	3.5
1	2	1	3
1	3	1	3
1	3	1	3
1	3	1	4
1	4	1	3
1	3	1	4
Grad	**Job Sat**	**Grad**	**Sal Sat**

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Grad	68	132	1.941176	0.832309
Job Sat	68	239.5	3.522059	1.100252

ANOVA

Source of Variati	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Grou	84.97243	1	84.97243	87.93762	2.25E-16	3.911794
Within Groups	129.4816	134	0.966281			
Total	214.454	135				

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Grad	68	132	1.941176	0.832309
Sal Sat	68	227.5	3.345588	1.1661

ANOVA

Source of Variati	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Grou	67.06066	1	67.06066	67.11406	1.8E-13	3.911794
Within Groups	133.8934	134	0.999204			
Total	200.954	135				

1	1	1	1.5
1	3	1	2
1	4	1	4
Mean	3.6		3.483333
Standard E	0.170193		0.154405
2	4	2	4
2	5	2	4
2	3	2	2
2	4	2	4
2	5	2	4
2	2	2	3
2	4	2	5
2	4	2	2
2	3	2	2
2	4.5	2	4.5
2	4	2	4
2	5	2	5
Mean	3.958333		3.625
Standard E	0.26442		0.32054
3	1	3	1
3	2	3	4
3	3	3	4
3	2	3	2
3	3	3	2.5
3	3	3	1
3	4	3	4
3	3	3	4
3	2	3	4
3	5	3	4
3	4	3	2
3	5	3	4
Grad	**Job Sat**	**Grad**	**Sal Sat**
3	4	3	5
3	1	3	2

	3	3	3	3
	3	5	3	5
	3	3	3	3
	3	4	3	4
	3	4	3	2
	3	5	3	5
	3	2	3	3
	3	3	3	2
	3	2	3	1
	3	4	3	4
	3	4	3	2
	3	3	3	2
Mean		3.230769		3.057692
Standard E		0.230769		0.248576

Attachment 14 REGRESSION ANALYSIS OF EMPLOYMENT DATA

Attach 14-1 All Employment Results

All Co-ops and non co-ops with usable results

	results 2Y	results FY	UG drwe (co-op) = 1	gender FM=1	Job search time (mth)	Total=FT time with coop em	Total =time (inc cop) in FT Employt	co-op salary	post co-op salary	start FT salary	current salary $ thousand
c1	16.67	16	1	1	0.5	1	2	27	na	37	38
c2	6	21.68	1	1	0.5	1	2	31.2	na	35	45
c3	16.67	19	1	0	5	1	2	27.75	na	38.5	40
c4	5	20	1	0	2.5	1	1.5	OS	na	40	40
c5	15.63	16	1	1	0	3	3	25	28	35	44
c6	11.47	20	1	1	0.5	1	2	25	na	29	40
c7	11	16	1	1	0	3	3	28	36.5	38.5	43.5
c8	12	24	1	1	0	2.5	2.75	25	32	34	42
c9	10	16.73	1	1	0	3	3	nr	32	37	61.67
c10	4.4	12.8	1	0	0.75	2	3.5	27.2	31.5	35	38
c11	7	2.92	1	0	0	3	3	22	33	38.5	40
c12	11	22.1	1	1	0	2.5	2.5	21	26	30	30
c13	16	24	1	0	0.25	1.1	3	22	35	50	60
c14	10	13.63	1	0	0	3	3	27.3	32.5	36	36
c15	23	13.33	1	1	0	2.5	2.5	21	31.2	40	46
c16	13	11	1	1	0	3	3	26.5	32	49	60
c17	12	27.67	1	1	0.5	1.2	2.2	24	24	35	OS
c18	15	11.2	1	1	0	3	3	22	30	32	33
c19	16	14	1	0	0	3.5	3.5	28	32	54	65
c20	2	12.67	1	1	0	1	2.6	20	22	31	35
c21	10	16.67	1	1	0.5	1	3	21	32	38	40.66
c22	20	15	1	1	0	1	2.6	24	34	38	40
c23	28.33	25.1	1	0	0	3.25	3.25	24.7	33	43	48
c24	19	16.73	1	0	0	2.2	2.2	24	24	30	40
c25	18.67	25	1	1	0	3	3	28	36.5	42	45
c26	10	8	1	0	0	2	3.6	26	28	33	35
c27	12.86	20.17	1	0	1.5	1	2	28.6	na	34	34
	results	results	UG drwe	gender	Job search	Total=FT time with	Total =time (inc cop) in	co-op	post co-op	start FT	current

	2Y	FY	(co-op) = 1	FM=1	time (mth)	coop em	FT Employt	salary	salary	salary	salary $ thousand
c28	14	16.89	1	1	0.25	2	2.5	28.2	40	34	34
c29	14	15.65	1	1	0	3	3	25	27	32	35
c30	21.56	21.13	1	1	0		2	25.9	na	41	46
**c31	9.33	15	1	1	**na**		**na**		37.5	**na**	**na**
**c32	23	28.67	1	1	**na**		**na**			**na**	**na**
nc1	2.86	6.29	0	0	0		1			25	29
nc2	14.86	18	0	0	0		2			34.1	44
nc3	24	24	0	0	6		1			42	60
*nc4	13	**na**	0	1	6		1			30	36.5
nc5	5	14.5	0	0	3.5		1.5			27.5	32.5
nc6	20.6	16	0	0	0		0.5			**nr**	25
nc7	11	16	0	0	1.5		1			27.5	40
*nc8	**na**	**na**	0	1	2		0.5			44.6	44.6
nc9	22	26	0	0	4		1			36.259	36.259
nc10	19	30	0	0	0		1			34	50
nc11	17	18	**1**	1	0		4			28	60
nc12	19	23	0	1	12		0.5			28	28
nc13	15	12	0	1	2		4			33	56.1
nc14	26	26.7	0	1	4		2			32	55
nc15	18	30	**1**	0	0		6			34	63
nc16	20	20.6	**1**	1	2		5			31	39
nc17	20	20	0	0	1		2			29	39
nc18	20	17	0	1	2		2			32	55
nc19	22	25	**1**	1	2		2.5			28.5	38
nc20	21.4	20.4	**1**	1	2.5		6			30.5	45
nc21	30	29	0	0	1		2			29.5	75
nc22	10	10	0	1	12		2.5			27.57	48.15
nc23	23	31	**1**	1	0		2.5			31.5	42
nc24	18	25	0	1	2		2.5			21	35.56
nc25	13	19	0	1	3		2.5			27	39

	results 2Y	results FY	UG drwe (co-op) = 1	gender FM=1	Job search time (mth)	Total=FT time with coop em	Total =time (inc cop) in FT Employt	co-op salary	post co-op salary	start FT salary	current salary $ thousand

*nc26**	17.6	7.2	**1**	1	0.75	4	**nr**	**nr**	**nr**
nc27	22.7	24	0	0	4	3		29	60
nc28	10.7	21.3	0	0	3	2		#29.859	35.656
nc29	9.8	12	**1**	0	4	2.5		30	55
nc30	20	22.9	0	0	6	2		31	36
nc31	9.8	14.2	**1**	0	1	4.5		35	50
nc32	17.8	22	0	0	8	2		28	31.5
nc33	26.7	24	**1**	0	2	2.5		32	37.585
nc34	23	25	**1**	1	0.5	5		32	56.1
nc35	22	24	**1**	1	0.5	2.5		31.2	42.5
nc36	22.7	19.2	0	1	0.5	2.5		31	56
nc37	15.1	16	**1**	1	0	8		33	41.248
nc38***	22	19	0	1	**24**	2		31	37
nc39	19	24	0	0	2	2		29.5	39

*not us academic since

** not u outcome results

*** not t time

NZ$ in 99

Attach 14-2 Reg 1: Impact of Final Year Results, Gender and DRWE on Starting Salaries

	Co-op=1 Co-op	results FY FY	gender FM=1 gender	(inc cop) in FT Employt DRWE	Starting Salary Sal
c1	1	16	1	2	37
c2	1	21.68	1	2	35
c3	1	19	0	2	38.5
c4	1	20	0	1.5	40
c5	1	16	1	3	35
c6	1	20	1	2	29
c7	1	16	1	3	38.5
c8	1	24	1	2.75	34
c9	1	16.73	1	3	37
c10	1	12.8	0	3.5	35
c11	1	2.92	0	3	38.5
c12	1	22.1	1	2.5	30
c13	1	24	0	3	50
c14	1	13.63	0	3	36
c15	1	13.33	1	2.5	40
c16	1	11	1	3	49
c17	1	27.67	1	2.2	35
c18	1	11.2	1	3	32
c19	1	14	0	3.5	54
c20	1	12.67	1	2.6	31
c21	1	16.67	1	3	38
c22	1	15	1	2.6	38
c23	1	25.1	0	3.25	43
c24	1	16.73	0	2.2	30
c25	1	25	1	3	42
c26	1	8	0	3.6	33
c27	1	20.17	0	2	34
c28	1	16.89	1	2.5	34
c29	1	15.65	1	3	32
c30	1	21.13	1	2	41
	Co-op=1	results FY	gender FM=1	(inc cop) in FT Employt	Starting Salary

Sal = f(FY, gender, DRWE)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.177364
R Square	0.031458
Adjusted R	-0.016969
Standard E	5.901238
Observatio	64

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regressior	3	67.86565	22.62188	0.649595	0.586295
Residual	60	2089.477	34.82462		
Total	63	2157.343			

	Coefficients	*tandard Erı*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	34.36992	3.121616	11.0103	4.93E-16	28.12576	40.61408	28.12576	40.61408
FY	-0.064849	0.125155	-0.518147	0.606261	-0.315197	0.185499	-0.315197	0.185499
gender	-1.544558	1.52031	-1.01595	0.313733	-4.58563	1.496513	-4.58563	1.496513
DRWE	0.556346	0.60301	0.922615	0.359903	-0.649853	1.762545	-0.649853	1.762545

	Co-op	FY	gender	DRWE	Sal
nc1	0	6.29	0	1	25
nc2	0	18	0	2	34.1
nc3	0	24	0	1	42
nc5	0	14.5	0	1.5	27.5
nc7	0	16	0	1	27.5
nc9	0	26	0	1	36.259
nc10	0	30	0	1	34
nc11	**1**	18	1	4	28
nc12	0	23	1	0.5	28
nc13	0	12	1	4	33
nc14	0	26.7	1	2	32
nc15	1	30	0	6	34
nc16	1	20.6	1	5	31
nc17	0	20	0	2	29
nc18	0	17	1	2	32
nc19	1	25	1	2.5	28.5
nc20	1	20.4	1	6	30.5
nc21	0	29	0	2	29.5
nc22	0	10	1	2.5	27.57
nc23	1	31	1	2.5	31.5
nc24	0	25	1	2.5	21
nc25	0	19	1	2.5	27
nc27	0	24	0	3	29
nc29	1	12	0	2.5	30
nc30	0	22.9	0	2	31
nc31	1	14.2	0	4.5	35
nc32	0	22	0	2	28
nc33	1	24	0	2.5	32
nc34	1	25	1	5	32
nc35	1	24	1	2.5	31.2
nc36	0	19.2	1	2.5	31
		results	gender	(inc cop) in	Starting
	Co-op=1	FY	FM=1	FT Employt	Salary
	Co-op	FY	gender	DRWE	Sal
nc37	1	16	1	8	33

nc38**	0	19	1	2	31
nc39	0	24	0	2	29.5

Attach 14-3 Reg 2: Impact of Final Year Results, Gender and DRWE on Current Salaries

	results FY	UG drwe (co-op) = 1	gender FM=1	(inc cop) in FT Employ	current salary $ thousand
	FY	Co-op	gender	DRWE	salary
c1	16	1	1	2	38
c2	21.68	1	1	2	45
c3	19	1	0	2	40
c4	20	1	0	1.5	40
c5	16	1	1	3	44
c6	20	1	1	2	40
c7	16	1	1	3	43.5
c8	24	1	1	2.75	42
c9	16.73	1	1	3	61.67
c10	12.8	1	0	3.5	38
c11	2.92	1	0	3	40
c12	22.1	1	1	2.5	30
c13	24	1	0	3	60
c14	13.63	1	0	3	36
c15	13.33	1	1	2.5	46
c16	11	1	1	3	60
c18	11.2	1	1	3	33
c19	14	1	0	3.5	65
c20	12.67	1	1	2.6	35
c21	16.67	1	1	3	40.66
c22	15	1	1	2.6	40
c23	25.1	1	0	3.25	48
c24	16.73	1	0	2.2	40
c25	25	1	1	3	45
c26	8	1	0	3.6	35
c27	20.17	1	0	2	34
c28	16.89	1	1	2.5	34
c29	15.65	1	1	3	35
	FY	(co-op) = 1	FM=1	FT Employ	salary $ thousand

SUMMARY OUTPUT Salary = f(FY,co-op, gender, DRWE)

Regression Statistics	
Multiple R	0.399595
R Square	0.159676
Adjusted R	0.103654
Standard E	9.849873
Observatio	65

ANOVA

	df	*SS*	*MS*	*F*	*Sig F*
Regressior	4	1106.127	276.5317	2.850254	0.03134
Residual	60	5821.2	97.02001		
Total	64	6927.327			

	Coefficients	*tandard Er*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	28.91666	5.1674	5.595982	5.74E-07	18.58033	39.25299	18.58033	39.25299
FY	0.43299	0.21194	2.042978	0.045455	0.009046	0.856935	0.009046	0.856935
Co-op	-2.200936	2.23326	-0.985525	0.328324	-6.668123	2.266251	-6.668123	2.266251
gender	-1.384057	2.53995	-0.544916	0.587831	-6.464707	3.696593	-6.464707	3.696593
DRWE	3.45153	1.26665	2.724923	0.008415	0.917849	5.985211	0.917849	5.985211

	FY	Co-op	gender	DRWE	salary
c30	21.13	1	1	2	46
nc1	6.29	0	0	1	29
nc2	18	0	0	2	44
nc3	24	0	0	1	60
nc5	14.5	0	0	1.5	32.5
nc6	16	0	0	0.5	25
nc7	16	0	0	1	40
nc9	26	0	0	1	36.259
nc10	30	0	0	1	50
nc11	18	2	1	4	60
nc12	23	0	1	0.5	28
nc13	12	0	1	4	56.1
nc14	26.7	0	1	2	55
nc15	30	2	0	6	63
nc16	20.6	2	1	5	39
nc17	20	0	0	2	39
nc18	17	0	1	2	55
nc19	25	2	1	2.5	38
nc20	20.4	2	1	6	45
nc21	29	0	0	2	75
nc22	10	0	1	2.5	48.15
nc23	31	2	1	2.5	42
nc24	25	0	1	2.5	35.56
nc25	19	0	1	2.5	39
nc27	24	0	0	3	60
nc28	21.3	0	0	2	35.656
nc29	12	2	0	2.5	55
nc30	22.9	0	0	2	36
nc31	14.2	2	0	4.5	50
nc32	22	0	0	2	31.5
nc33	24	2	0	2.5	37.585
	FY	(co-op) = 1	FM=1	FT Employ	salary
					$ thousand
	FY	Co-op	gender	DRWE	salary
nc34	25	2	1	5	56.1

nc35	24	2	1	2.5	42.5
nc36	19.2	0	1	2.5	56
nc37	16	2	1	8	41.248
nc38	19	0	1	2	37
nc39	24	0	0	2	39

Attach 14-4 Reg 3: Impact on Current Salaries- All Co-ops and only Non Co-ops with no UG DRWE

	FY	Co-op	gender	DRWE	Current salary
c1	16	1	1	2	38
c2	21.68	1	1	2	45
c3	19	1	0	2	40
c4	20	1	0	1.5	40
c5	16	1	1	3	44
c6	20	1	1	2	40
c7	16	1	1	3	43.5
c8	24	1	1	2.75	42
c9	16.73	1	1	3	61.67
c10	12.8	1	0	3.5	38
c11	2.92	1	0	3	40
c12	22.1	1	1	2.5	30
c13	24	1	0	3	60
c14	13.63	1	0	3	36
c15	13.33	1	1	2.5	46
c16	11	1	1	3	60
c18	11.2	1	1	3	33
c19	14	1	0	3.5	65
c20	12.67	1	1	2.6	35
c21	16.67	1	1	3	40.66
c22	15	1	1	2.6	40
c23	25.1	1	0	3.25	48
c24	16.73	1	0	2.2	40
c25	25	1	1	3	45
c26	8	1	0	3.6	35
c27	20.17	1	0	2	34
c28	16.89	1	1	2.5	34
c29	15.65	1	1	3	35
c30	21.13	1	1	2	46
nc1	6.29	0	0	1	29
nc2	18	0	0	2	44

	FY	Co-op	gender	DRWE	Current salary

SUMMARY OUTPUT Salary=f(Co-op, gender,DRWE, FY)

Regression Statistics	
Multiple R	0.496362
R Square	0.246376
Adjusted R	0.183574
Standard Er	9.572766
Observation	53

ANOVA

	df	*SS*	*MS*	*F*	*Sig F*
Regressior	4	1438	359.4999	3.92305	0.007787
Residual	48	4398.617	91.63785		
Total	52	5836.617			

	Coefficients	*tandard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	17.54556	7.205826	2.434913	0.018662	3.057283	32.03383	3.057283	32.03383
FY	0.63448	0.250181	2.536083	0.014519	0.131457	1.137502	0.131457	1.137502
Co-op	-4.558452	3.178992	-1.43393	0.158075	-10.95024	1.833335	-10.95024	1.833335
gender	-0.623078	2.751881	-0.226419	0.821837	-6.156102	4.909947	-6.156102	4.909947
DRWE	7.181715	2.057577	3.490375	0.001045	3.044682	11.31875	3.044682	11.31875

nc3	24	0	0	1	60
nc5	14.5	0	0	1.5	32.5
nc6	16	0	0	0.5	25
nc7	16	0	0	1	40
nc9	26	0	0	1	36.259
nc10	30	0	0	1	50
nc12	23	0	1	0.5	28
nc13	12	0	1	4	56.1
nc14	26.7	0	1	2	55
nc17	20	0	0	2	39
nc18	17	0	1	2	55
nc21	29	0	0	2	75
nc22	10	0	1	2.5	48.15
nc24	25	0	1	2.5	35.56
nc25	19	0	1	2.5	39
nc27	24	0	0	3	60
nc28	21.3	0	0	2	35.656
nc30	22.9	0	0	2	36
nc32	22	0	0	2	31.5
nc36	19.2	0	1	2.5	56
nc38	19	0	1	2	37
nc39	24	0	0	2	39

Attachment 14 REGRESSION ANALYSIS OF EMPLOYMENT DATA

Attach 14-1 All Employment Results

All Co-ops and non co-ops with usable results

	results 2Y	results FY	UG drwe (co-op) = 1	gender FM=1	Job search time (mth)	Total=FT time with coop em	Total =time (inc cop) in FT Employt	co-op salary	post co-op salary	start FT salary	current salary $ thousand
c1	16.67	16	1	1	0.5	1	2	27	na	37	38
c2	6	21.68	1	1	0.5	1	2	31.2	na	35	45
c3	16.67	19	1	0	5	1	2	27.75	na	38.5	40
c4	5	20	1	0	2.5	1	1.5	OS	na	40	40
c5	15.63	16	1	1	0	3	3	25	28	35	44
c6	11.47	20	1	1	0.5	1	2	25	na	29	40
c7	11	16	1	1	0	3	3	28	36.5	38.5	43.5
c8	12	24	1	1	0	2.5	2.75	25	32	34	42
c9	10	16.73	1	1	0	3	3	nr	32	37	61.67
c10	4.4	12.8	1	0	0.75	2	3.5	27.2	31.5	35	38
c11	7	2.92	1	0	0	3	3	22	33	38.5	40
c12	11	22.1	1	1	0	2.5	2.5	21	26	30	30
c13	16	24	1	0	0.25	1.1	3	22	35	50	60
c14	10	13.63	1	0	0	3	3	27.3	32.5	36	36
c15	23	13.33	1	1	0	2.5	2.5	21	31.2	40	46
c16	13	11	1	1	0	3	3	26.5	32	49	60
c17	12	27.67	1	1	0.5	1.2	2.2	24	24	35	OS
c18	15	11.2	1	1	0	3	3	22	30	32	33
c19	16	14	1	0	0	3.5	3.5	28	32	54	65
c20	2	12.67	1	1	0	1	2.6	20	22	31	35
c21	10	16.67	1	1	0.5	1	3	21	32	38	40.66
c22	20	15	1	1	0	1	2.6	24	34	38	40
c23	28.33	25.1	1	0	0	3.25	3.25	24.7	33	43	48
c24	19	16.73	1	0	0	2.2	2.2	24	24	30	40
c25	18.67	25	1	1	0	3	3	28	36.5	42	45
c26	10	8	1	0	0	2	3.6	26	28	33	35
c27	12.86	20.17	1	0	1.5	1	2	28.6	na	34	34
	results	results	UG drwe	gender	Job search	Total=FT time with	Total =time (inc cop) in	co-op	post co-op	start FT	current

	2Y	FY	(co-op) = 1	FM=1	time (mth)	coop em	FT Employt	salary	salary	salary	salary $ thousand
c28	14	16.89	1	1	0.25	2	2.5	28.2	40	34	34
c29	14	15.65	1	1	0	3	3	25	27	32	35
c30	21.56	21.13	1	1	0		2	25.9	na	41	46
**c31	9.33	15	1	1	**na**		**na**		37.5	**na**	**na**
**c32	23	28.67	1	1	**na**		**na**			**na**	**na**
nc1	2.86	6.29	0	0	0		1			25	29
nc2	14.86	18	0	0	0		2			34.1	44
nc3	24	24	0	0	6		1			42	60
*nc4	13	**na**	0	1	6		1			30	36.5
nc5	5	14.5	0	0	3.5		1.5			27.5	32.5
nc6	20.6	16	0	0	0		0.5			**nr**	25
nc7	11	16	0	0	1.5		1			27.5	40
*nc8	**na**	**na**	0	1	2		0.5			44.6	44.6
nc9	22	26	0	0	4		1			36.259	36.259
nc10	19	30	0	0	0		1			34	50
nc11	17	18	**1**	1	0		4			28	60
nc12	19	23	0	1	12		0.5			28	28
nc13	15	12	0	1	2		4			33	56.1
nc14	26	26.7	0	1	4		2			32	55
nc15	18	30	**1**	0	0		6			34	63
nc16	20	20.6	**1**	1	2		5			31	39
nc17	20	20	0	0	1		2			29	39
nc18	20	17	0	1	2		2			32	55
nc19	22	25	**1**	1	2		2.5			28.5	38
nc20	21.4	20.4	**1**	1	2.5		6			30.5	45
nc21	30	29	0	0	1		2			29.5	75
nc22	10	10	0	1	12		2.5			27.57	48.15
nc23	23	31	**1**	1	0		2.5			31.5	42
nc24	18	25	0	1	2		2.5			21	35.56
nc25	13	19	0	1	3		2.5			27	39

	results 2Y	results FY	UG drwe (co-op) = 1	gender FM=1	Job search time (mth)	Total=FT time with coop em	Total =time (inc cop) in FT Employt	co-op salary	post co-op salary	start FT salary	current salary $ thousand

*nc26**	17.6	7.2	**1**	1	0.75	4	**nr**	**nr**	**nr**
nc27	22.7	24	0	0	4	3		29	60
nc28	10.7	21.3	0	0	3	2		#29.859	35.656
nc29	9.8	12	**1**	0	4	2.5		30	55
nc30	20	22.9	0	0	6	2		31	36
nc31	9.8	14.2	**1**	0	1	4.5		35	50
nc32	17.8	22	0	0	8	2		28	31.5
nc33	26.7	24	**1**	0	2	2.5		32	37.585
nc34	23	25	**1**	1	0.5	5		32	56.1
nc35	22	24	**1**	1	0.5	2.5		31.2	42.5
nc36	22.7	19.2	0	1	0.5	2.5		31	56
nc37	15.1	16	**1**	1	0	8		33	41.248
nc38***	22	19	0	1	**24**	2		31	37
nc39	19	24	0	0	2	2		29.5	39

*not us academic since

** not u outcome results

*** not t time

NZ$ in 99

Attach 14-2 Reg 1: Impact of Final Year Results, Gender and DRWE on Starting Salaries

	Co-op=1 Co-op	results FY FY	gender FM=1 gender	(inc cop) in FT Employt DRWE	Starting Salary Sal
c1	1	16	1	2	37
c2	1	21.68	1	2	35
c3	1	19	0	2	38.5
c4	1	20	0	1.5	40
c5	1	16	1	3	35
c6	1	20	1	2	29
c7	1	16	1	3	38.5
c8	1	24	1	2.75	34
c9	1	16.73	1	3	37
c10	1	12.8	0	3.5	35
c11	1	2.92	0	3	38.5
c12	1	22.1	1	2.5	30
c13	1	24	0	3	50
c14	1	13.63	0	3	36
c15	1	13.33	1	2.5	40
c16	1	11	1	3	49
c17	1	27.67	1	2.2	35
c18	1	11.2	1	3	32
c19	1	14	0	3.5	54
c20	1	12.67	1	2.6	31
c21	1	16.67	1	3	38
c22	1	15	1	2.6	38
c23	1	25.1	0	3.25	43
c24	1	16.73	0	2.2	30
c25	1	25	1	3	42
c26	1	8	0	3.6	33
c27	1	20.17	0	2	34
c28	1	16.89	1	2.5	34
c29	1	15.65	1	3	32
c30	1	21.13	1	2	41
	Co-op=1	results FY	gender FM=1	(inc cop) in FT Employt	Starting Salary

Sal = f(FY, gender, DRWE)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.177364
R Square	0.031458
Adjusted R	-0.016969
Standard E	5.901238
Observatio	64

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regressior	3	67.86565	22.62188	0.649595	0.586295
Residual	60	2089.477	34.82462		
Total	63	2157.343			

	Coefficients	*tandard Erı*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	34.36992	3.121616	11.0103	4.93E-16	28.12576	40.61408	28.12576	40.61408
FY	-0.064849	0.125155	-0.518147	0.606261	-0.315197	0.185499	-0.315197	0.185499
gender	-1.544558	1.52031	-1.01595	0.313733	-4.58563	1.496513	-4.58563	1.496513
DRWE	0.556346	0.60301	0.922615	0.359903	-0.649853	1.762545	-0.649853	1.762545

	Co-op	FY	gender	DRWE	Sal
nc1	0	6.29	0	1	25
nc2	0	18	0	2	34.1
nc3	0	24	0	1	42
nc5	0	14.5	0	1.5	27.5
nc7	0	16	0	1	27.5
nc9	0	26	0	1	36.259
nc10	0	30	0	1	34
nc11	**1**	18	1	4	28
nc12	0	23	1	0.5	28
nc13	0	12	1	4	33
nc14	0	26.7	1	2	32
nc15	1	30	0	6	34
nc16	1	20.6	1	5	31
nc17	0	20	0	2	29
nc18	0	17	1	2	32
nc19	1	25	1	2.5	28.5
nc20	1	20.4	1	6	30.5
nc21	0	29	0	2	29.5
nc22	0	10	1	2.5	27.57
nc23	1	31	1	2.5	31.5
nc24	0	25	1	2.5	21
nc25	0	19	1	2.5	27
nc27	0	24	0	3	29
nc29	1	12	0	2.5	30
nc30	0	22.9	0	2	31
nc31	1	14.2	0	4.5	35
nc32	0	22	0	2	28
nc33	1	24	0	2.5	32
nc34	1	25	1	5	32
nc35	1	24	1	2.5	31.2
nc36	0	19.2	1	2.5	31
		results	gender	(inc cop) in	Starting
	Co-op=1	FY	FM=1	FT Employt	Salary
	Co-op	FY	gender	DRWE	Sal
nc37	1	16	1	8	33

nc38**	0	19	1	2	31
nc39	0	24	0	2	29.5

Attach 14-3 Reg 2: Impact of Final Year Results, Gender and DRWE on Current Salaries

	results FY	UG drwe (co-op) = 1	gender FM=1	(inc cop) in FT Employ	current salary $ thousand
	FY	Co-op	gender	DRWE	salary
c1	16	1	1	2	38
c2	21.68	1	1	2	45
c3	19	1	0	2	40
c4	20	1	0	1.5	40
c5	16	1	1	3	44
c6	20	1	1	2	40
c7	16	1	1	3	43.5
c8	24	1	1	2.75	42
c9	16.73	1	1	3	61.67
c10	12.8	1	0	3.5	38
c11	2.92	1	0	3	40
c12	22.1	1	1	2.5	30
c13	24	1	0	3	60
c14	13.63	1	0	3	36
c15	13.33	1	1	2.5	46
c16	11	1	1	3	60
c18	11.2	1	1	3	33
c19	14	1	0	3.5	65
c20	12.67	1	1	2.6	35
c21	16.67	1	1	3	40.66
c22	15	1	1	2.6	40
c23	25.1	1	0	3.25	48
c24	16.73	1	0	2.2	40
c25	25	1	1	3	45
c26	8	1	0	3.6	35
c27	20.17	1	0	2	34
c28	16.89	1	1	2.5	34
c29	15.65	1	1	3	35
	FY	(co-op) = 1	FM=1	FT Employ	salary $ thousand

SUMMARY OUTPUT Salary = f(FY,co-op, gender, DRWE)

Regression Statistics	
Multiple R	0.399595
R Square	0.159676
Adjusted R	0.103654
Standard E	9.849873
Observatio	65

ANOVA

	df	*SS*	*MS*	*F*	*Sig F*
Regressior	4	1106.127	276.5317	2.850254	0.03134
Residual	60	5821.2	97.02001		
Total	64	6927.327			

	Coefficients	*tandard Er*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	28.91666	5.1674	5.595982	5.74E-07	18.58033	39.25299	18.58033	39.25299
FY	0.43299	0.21194	2.042978	0.045455	0.009046	0.856935	0.009046	0.856935
Co-op	-2.200936	2.23326	-0.985525	0.328324	-6.668123	2.266251	-6.668123	2.266251
gender	-1.384057	2.53995	-0.544916	0.587831	-6.464707	3.696593	-6.464707	3.696593
DRWE	3.45153	1.26665	2.724923	0.008415	0.917849	5.985211	0.917849	5.985211

	FY	Co-op	gender	DRWE	salary
c30	21.13	1	1	2	46
nc1	6.29	0	0	1	29
nc2	18	0	0	2	44
nc3	24	0	0	1	60
nc5	14.5	0	0	1.5	32.5
nc6	16	0	0	0.5	25
nc7	16	0	0	1	40
nc9	26	0	0	1	36.259
nc10	30	0	0	1	50
nc11	18	2	1	4	60
nc12	23	0	1	0.5	28
nc13	12	0	1	4	56.1
nc14	26.7	0	1	2	55
nc15	30	2	0	6	63
nc16	20.6	2	1	5	39
nc17	20	0	0	2	39
nc18	17	0	1	2	55
nc19	25	2	1	2.5	38
nc20	20.4	2	1	6	45
nc21	29	0	0	2	75
nc22	10	0	1	2.5	48.15
nc23	31	2	1	2.5	42
nc24	25	0	1	2.5	35.56
nc25	19	0	1	2.5	39
nc27	24	0	0	3	60
nc28	21.3	0	0	2	35.656
nc29	12	2	0	2.5	55
nc30	22.9	0	0	2	36
nc31	14.2	2	0	4.5	50
nc32	22	0	0	2	31.5
nc33	24	2	0	2.5	37.585
	FY	(co-op) = 1	FM=1	FT Employ	salary
					$ thousand
	FY	Co-op	gender	DRWE	salary
nc34	25	2	1	5	56.1

nc35	24	2	1	2.5	42.5
nc36	19.2	0	1	2.5	56
nc37	16	2	1	8	41.248
nc38	19	0	1	2	37
nc39	24	0	0	2	39

Attach 14-4 Reg 3: Impact on Current Salaries- All Co-ops and only Non Co-ops with no UG DRWE

	FY	Co-op	gender	DRWE	Current salary
c1	16	1	1	2	38
c2	21.68	1	1	2	45
c3	19	1	0	2	40
c4	20	1	0	1.5	40
c5	16	1	1	3	44
c6	20	1	1	2	40
c7	16	1	1	3	43.5
c8	24	1	1	2.75	42
c9	16.73	1	1	3	61.67
c10	12.8	1	0	3.5	38
c11	2.92	1	0	3	40
c12	22.1	1	1	2.5	30
c13	24	1	0	3	60
c14	13.63	1	0	3	36
c15	13.33	1	1	2.5	46
c16	11	1	1	3	60
c18	11.2	1	1	3	33
c19	14	1	0	3.5	65
c20	12.67	1	1	2.6	35
c21	16.67	1	1	3	40.66
c22	15	1	1	2.6	40
c23	25.1	1	0	3.25	48
c24	16.73	1	0	2.2	40
c25	25	1	1	3	45
c26	8	1	0	3.6	35
c27	20.17	1	0	2	34
c28	16.89	1	1	2.5	34
c29	15.65	1	1	3	35
c30	21.13	1	1	2	46
nc1	6.29	0	0	1	29
nc2	18	0	0	2	44

	FY	Co-op	gender	DRWE	Current salary

SUMMARY OUTPUT Salary=f(Co-op, gender,DRWE, FY)

Regression Statistics	
Multiple R	0.496362
R Square	0.246376
Adjusted R	0.183574
Standard Er	9.572766
Observation	53

ANOVA

	df	*SS*	*MS*	*F*	*Sig F*
Regressior	4	1438	359.4999	3.92305	0.007787
Residual	48	4398.617	91.63785		
Total	52	5836.617			

	Coefficients	*tandard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Jpper 95.0%*
Intercept	17.54556	7.205826	2.434913	0.018662	3.057283	32.03383	3.057283	32.03383
FY	0.63448	0.250181	2.536083	0.014519	0.131457	1.137502	0.131457	1.137502
Co-op	-4.558452	3.178992	-1.43393	0.158075	-10.95024	1.833335	-10.95024	1.833335
gender	-0.623078	2.751881	-0.226419	0.821837	-6.156102	4.909947	-6.156102	4.909947
DRWE	7.181715	2.057577	3.490375	0.001045	3.044682	11.31875	3.044682	11.31875

nc3	24	0	0	1	60
nc5	14.5	0	0	1.5	32.5
nc6	16	0	0	0.5	25
nc7	16	0	0	1	40
nc9	26	0	0	1	36.259
nc10	30	0	0	1	50
nc12	23	0	1	0.5	28
nc13	12	0	1	4	56.1
nc14	26.7	0	1	2	55
nc17	20	0	0	2	39
nc18	17	0	1	2	55
nc21	29	0	0	2	75
nc22	10	0	1	2.5	48.15
nc24	25	0	1	2.5	35.56
nc25	19	0	1	2.5	39
nc27	24	0	0	3	60
nc28	21.3	0	0	2	35.656
nc30	22.9	0	0	2	36
nc32	22	0	0	2	31.5
nc36	19.2	0	1	2.5	56
nc38	19	0	1	2	37
nc39	24	0	0	2	39

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